ISSN 1745-8587

School of Economics, Mathematics and Statistics

BWPEF 0808

Political Cycles in a Small Open Economy and the Effect of Economic Integration: Evidence from Cyprus

Georgios Efthyvoulou
Birkbeck, University of London

December 2008

Birkbeck Working Papers in Economics & Finance

Political Cycles in a Small Open Economy and the Effect of Economic Integration: Evidence from Cyprus

Georgios Efthyvoulou*

December 2008

Abstract

This paper examines whether partisan politics and opportunistic government behavior generate political cycles in a small open economy, and, if so, whether such effects survive under increased economic integration. We discuss evidence drawn from Cyprus for the period 1978-2006. The empirical analysis extends the work of Alesina *et al.* (1997) to accommodate the special features of the Cypriot economy in a controlled environment era and follows a more technical econometric approach to ensure that our estimations will not draw misleading inferences. The results are in line with the rational partisan model and are similar to the ones obtained for other countries. On the other hand, the findings for Cyprus support also the existence of an electoral cycle in fiscal policy and reject the one in monetary policy. We argue that the unique politico-economic profile of a country is crucial for the empirical success of different theories. Furthermore, we find that the reported effects do not persist in the run-up to EU accession and ERM II participation. The implementation of several structural reforms and the Maastricht criteria seem to affect governments' ability to influence the domestic economy.

JEL classification: C51; E32; F15; F41
Keywords: Cyprus; political cycles; small-open economy; economic integration

*School of Economics, Mathematics and Statistics, Birkbeck College, University of London, Malet Street, London, WC1E 7HX, UK; email: g.efthyvoulou@ems.bbk.ac.uk; tel: +44 (0) 20 7631 6426; fax: +44 (0) 20 7631 6416

1 Introduction

One of the most fundamental questions in the field of political economy is the interplay between the political environment and economic performance. Over the last three decades economists have paid a great deal of attention to exploring macroeconomic fluctuations as an interaction between market forces and government behavior, leading to political cycles theories. These theories fall into two broad categories: the "opportunistic" and the "partisan". The former claim that all governments propose the same platform to voters and choose policies to maximize their popularity and, therefore, their chance of being reelected. The latter assume that government preferences differ over policies and argue that the economy is influenced by the ideological orientation and philosophy of the party in office.

There is an extensive empirical literature on how the political process influences the economies of several industrial countries. However, empirical studies that focus exclusively on small open economies are relatively rare. An enquiry in this direction may reveal that when the economy is very sensitive to external economic and political factors, governments feel particularly constrained in pursuing their political targets and hence, political cycles are less pronounced. Lindbeck (1976) notes that under the "small country assumption" the room for national stabilization policy is limited while Alesina *et al.* (1997) stress that politicians' goals in small open economies are likely to be defined in relation to the rest of the world. The present paper tests these hypotheses empirically using data drawn from Cyprus, one of the smallest countries in Europe with extensive trade and financial linkages throughout the region[1]. This paper also investigates whether the process of joining the European Union (EU) and the Exchange Rate Mechanism (ERM II) has reduced the dimension of partisan and electoral effects observed in Cyprus. A positive answer to the latter question would lend support to the view that politics will not be that important for macroeconomic policies inside the European Monetary Union (EMU), and more generally, that political cycles will be mitigated in the future. The design of our empirical analysis builds on the work of Alesina *et al.* (1997). However, in order to ensure that our estimated results will not draw misleading inferences, we adopt a more technical econometric approach and perform several robustness tests capturing the unique features of the Cypriot economy in a controlled environment era.

The main findings of the paper can be summarized as follows. First, political considerations tend to influence the determination of economic outcomes and the choice of policy instrument in Cyprus, despite the smallness and openness of its economy. In particular, we find that, during the period 1978-2003, partisanship plays the role partisan theory predicts and its impact is consistent with the overall pattern of evidence for other countries (see Alesina *et al.* , 1997). On the other hand, the analysis for Cyprus, unlike the one for other countries, validates the hypothesis of opportunistic motivations in fiscal policy and fails to detect electoral cycles in monetary policy. The unique politico-economic profile of Cyprus, coupled with the fact that different admin-

[1]Cyprus has an open, free-market, service-based economy and it is classified amongst the advanced economies of the world by the International Monetary Fund (World Economic Outlook, 2007). The World Bank in its July 2002 list of economies classifies Cyprus as a high income country - it holds the 16th place worldwide in terms of per capital income. During the period 1981-1997, the average growth rate of the economy was about 5.4%, which compares very favorably with growth rates in other developed and developing countries during the same period (Temple, 1997). During the period 2002-2007, the average growth rate was about 3.8%, while inflation stood at 2.9% and unemployment at 3.4% (Statistical Service of Cyprus Report, 2007). On May, 2004, Cyprus became a full member of the European Union and from January 2008, the country entered the Eurozone and adopted the euro.

istrations use different instruments to achieve the same goals, seems to be responsible for the aforementioned results. Second, political cycles in Cyprus appear to be less systematic in the post-2003 period, implying that politics become less important as a country moves towards greater economic integration with EMU members.

The paper proceeds as follows. Section 1.1 provides a brief overview of political cycles' literature. Section 2 describes the data, sources and variables used. Section 3 presents the econometric techniques applied and the specification of the empirical tests. Section 4 investigates whether the cyclical movements of economic outcomes are systematically affected by partisan and opportunistic considerations in the case of Cyprus. Section 5 follows the same procedure as in Section 4 to test for the presence of political cycles in macroeconomic policy instruments. Section 6 discusses the results obtained and addresses some directions of future research.

1.1 Theoretical and Empirical Overview

The opportunistic model in its traditional form was firstly developed by Nordhaus (1975) and Lindbeck (1976) and is underlined by the Phillips curve trade-off and voters' naivety and myopia. It predicts that the politically determined policy choice will result in a "political business cycle": output growth above normal, unemployment below normal and a moderate increase in inflation before elections, and a more substantial increase in inflation after the election, which is soon reduced with a recession. Voters, whose electoral choice is sensitive to macroeconomic variables, respond positively and reward this behavior, not recognizing that after the election inflation will rise while output and employment will return to their natural rates.

A second phase of the literature on opportunistic models took off after the rational expectations revolution of the seventies. Several authors propose models that incorporate voters' rationality into the governments' opportunistic behavior and argue that electoral cycles in certain macroeconomic variables derive from temporary information asymmetries. More precisely, they assume that the government observes an indicator of its "competence" before the representative voter does and, therefore, it tries to signal that it is doing well prior to election periods. Cukierman & Meltzer (1986) define competence as the ability to forecast the performance of the economy and show that most governments use discretionary policy to increase the probability of reelection leading to socially suboptimal choices of policy instruments. Rogoff & Sibert (1988) measure competence as the ability to administer the public goods production process (finance the required amount of spending with a smaller amount of revenues) and present a political cycle in fiscal policy - labeled political budget cycle. Their model predicts that in the preelectoral period, taxation is below the efficient level and inflation above optimal. Rogoff (1990) considers a similar model and suggests that governments tend to bias preelection fiscal policy towards easily observed consumption expenditures and away from investment projects. Finally, Persson & Tabellini (1990) modify the Phillips curve equation by adding a competence term, defined as the ability to increase output growth without inflation. Their model generates a political business cycle but not in the form of the traditional Nordhaus-Lindbeck model, in the sense that it does not predict a postelectoral recession after the preelectoral boom.

The partisan model in its traditional form was originally proposed by Hibbs (1977) following an empirical analysis of aggregate data in several countries. It argues that governments pursue macroeconomic policies according to the objective economic interests and subjective preferences of their class-defined core political constituencies. In other words, left-wing governments are more concerned with unemployment and growth and

relatively less with inflation while right-wing parties have opposite preferences.

Alesina (1987) approaches Hibbs's partisan model relying on rational voting behavior and uses a wage-contract interpretation of the Phillips curve. The prediction of his model involves transitory, rather than persistent, differences in real economic outcomes. Specifically, Alesina (1987) shows that the output effects associated with a government change toward the left derive from the surprise inflation; a new government will increase the rate of growth of the money supply leading to a higher inflation and, for a given real interest rate, to a higher nominal interest rate, a transitory reduction in real wages and an output increase. This output stimulus will persist as long as the wage adjustment process is subject to inertia because of staggered or overlapping labor contracts. Consequently, one should observe recessions in the first part of right-wing administrations, as compared with higher output growth and inflation in the first part of left-wing administrations. In the second part, output growth should return to its natural level for both types and inflation should remain higher during a left-wing administration.

The empirical implications of these four types of models (see Table A.2.1 and Table A.2.2 on page 34) have been tested by Alesina and several co-authors on data for the United States and other OECD countries, confirming their predecessors' conclusions. Generally speaking, the partisan models based on rational choice and expectations are empirically more successful than the partisan models in their traditional form. Moreover, the partisan models perform better than the opportunistic ones in explaining macroeconomic fluctuations in output growth and unemployment. The findings on opportunistic effects are limited to short-run and occasional manipulations of inflation and certain policy instruments before elections. In other words, the evidence reinforces the rational partisan theory of Alesina (1987), rejects Nordhaus-Lindbeck's political business cycle and fails to reject the rational opportunistic models of Rogoff & Sibert (1988) and Rogoff (1990) for several countries. With the recent advance in European economic integration, the empirical literature has started to investigate different situations where countries are highly economically interdependent and turned its attention to political effects on fiscal policy. However, the results obtained from these studies are relatively mixed (for more details see Section 5.2. on Fiscal Policy).

2 Data

We consider Cyprus macroeconomic time series for the period 1978-2006[2]. The variables are extracted from several data sources in Cyprus (the Statistical Service of Cyprus, the Ministry of Finance, the Central Bank of Cyprus, the Press and Information Office and the Economics Research Center) and the databases of IMF-IFS and Eurostat. The economic data consists of quarterly observations on economic outcomes (output growth rates, unemployment rates and inflation rates), quarterly observations on representative instruments of monetary policy (growth rates of monetary aggregates - M1 and M2 - and short term interest rates - three month treasury bill rates and retail bank lending rates) and yearly observations on fiscal policy measures (budget deficits and changes in the components of the fiscal balance). Note that all economic series for which we have quarterly observations are seasonally adjusted using the X12 ARIMA method of the US Census Bereau[3]. Moreover, in order to remove the strong seasonal persistence in

[2]We use the post-1978 period for two reasons. First, during the years 1976-1980 the production in Cyprus reached its pre-invasion level soon after the Turkish invasion of 1974 (Pashardes & Hajispyrou, 2003) and second, half of the political parties being considered for this analysis were founded in 1976 and therefore, the presidential elections of 1978 were the first ones under the current partisan structure.

[3]The interest rates are not seasonally adjusted since the seasonality hypothesis is rejected.

growth rates, we take the seasonal difference of natural logarithms[4]. The time span is determined by the availability of observations (see Table A.2.3 on page 35). The political data include presidential election dates[5] and the government's political orientation[6]. The government can be defined as right, left or centrist according to which party holds the presidency. In the case that more than one party form the government, the coalition can be described as either center-right or center-left. Finally, when the president appears to be without a clear political orientation - not a member of a particular party - the government is classified according to the parties that nominate or support the president[7] (see Table A.2.4 on page 35).

3 Econometric Methodology

Following the empirical analysis of Alesina *et al.* (1997), we test the various theories of political cycles by running regressions of time-series data including political variables among the regressors. Alesina *et al.* (1997) rely on the assumption that all macroeconomic variables are generated by a covariance-stationary stochastic process that can be expressed in autoregressive form but they do not apply any modern techniques to confirm its validity. Recently, the importance of using the most appropriate specification for modeling the deterministic component of an economic time series has been emphasized (see Enders, 2003). Moreover, the stationarity in macroeconomic time series is a vital issue since misspecification of a random walk as a stationary process evolving around a deterministic trend has major effects on the statistical analysis of the data (Maddala & Kim, 1998). Therefore, in order to ensure that our estimated results will not draw misleading inferences, we firstly examine the stability of the series by applying unit root tests, both in the absence and in the presence of structural breaks, and secondly use the Box-Jenkins modeling procedure and ARCH techniques to model the stationary component of each regression equation and the variance of the error component (see Appendix A.1 for relevant theory). Hence, the econometric methodology in this paper is divided in three parts: (i) unit root analysis, (ii) model selection and (iii) specification of empirical tests on political cycles. Note that for the time being we focus on the three economic outcomes and the four monetary policy instruments, as defined in Section 2, for which we have quarterly observations. Also note that, since the econometric analysis provides nearly the same results for the two short term interest rates, we present the results on the treasury bill rates only.

[4]The output growth rate in quarter t is defined as the yearly rate of change of real gross domestic product (RGDP), i.e. $y_t = (\ln RGDP_t - \ln RGDP_{t-4}) \times 100$, the inflation rate as the yearly rate of change of consumer price index (CPI), i.e. $\pi_t = (\ln CPI_t - \ln CPI_{t-4}) \times 100$, and the money growth rates as the yearly rate of change of M1 and M2, i.e. $m1_t = (\ln M1_t - \ln M1_{t-4}) \times 100$ and $m2_t = (\ln M2_t - \ln M2_{t-4}) \times 100$, respectively.

[5]The president of Cyprus is elected for a five year term directly by the people. The president is both head of state and head of government, and of a pluriform multi-party system. Executive power is exercised by the government. Federal legislative power is vested in both the government and the House of Representatives.

[6]For this definition we take into account the four strong parties that generally dominate the political landscape in Cyprus: AKEL: Progressive Party of Working People (left), DISY: Democratic Rally (right), DIKO: Democratic Party (centrist) and EDEK: United Democratic Union of Center (centrist).

[7]It should be noted that classification is made on a priori ground and is never changed after the first regression is run.

Table 3.1: DF Test with no Structural Breaks

Variable	No Trend	Trend
	$\alpha[k]$	$\alpha[k]$
	(t-statistic)	(t-statistic)
Output growth rate	-0.80*** [4]	-0.98*** [4]
	(4.08)	(4.60)
Unemployment rate	-0.13 [1]	-0.17 [1]
	(2.60)	(2.83)
Inflation rate	-0.07 [4]	-0.13 [4]
	(1.74)	(2.37)
M1 growth rate	-0.33*** [7]	-0.34** [7]
	(4.04)	(3.93)
M2 growth rate	-0.12* [5]	-0.20* [5]
	(2.73)	(3.28)
T-bill interest rate	0.01 [0]	-0.02 [0]
	(0.20)	(0.76)

α denotes the coefficient on the time series variable at lag 1; k denotes the lag length. ***, **, * Statistically significant at the 1%, 5% and 10% confidence level respectively.

Table 3.2: Unit Root Tests with Structural Breaks

Variable	Model	Break Dates	$\alpha[k]$	t-statistic
Unemployment rate	Perron - A	1986:3	—	3.65*
	Perron - A	1991:1	—	3.74*
	Perron - C	1986:3	—	5.22***
	Zivot & Andrews - C	1986:4	-0.38 [0]	5.56**
	Lumsdaine & Papell - C	1987:1 1990:4	-0.38 [0]	6.70*
	Lee & Strazicich - A	1991:2	-0.23 [3]	3.79**
	Lee & Strazicich - A	1991:1 1991:3	-0.26 [0]	4.05**
	Lee & Strazicich - C	1986:4 1990:3	-0.46 [0]	5.74**
Inflation rate	Perron - A	1981:4	—	4.55***
	Perron - C	1981:4	—	4.02**
	Perron - C	1986:3	—	4.04*
	Zivot & Andrews - A	1981:3	-0.30 [8]	4.72*
M2 growth rate	Perron - A	1999:4	—	3.52*
	Lee & Strazicich - A	2000:2	-0.15 [5]	3.27*
T-bill interest rate	Perron - C	1996:1	—	4.33**
	Perron - C	2001:1	—	4.64**
	Zivot & Andrews - C	2001:3	-0.42 [3]	5.12**
	Lumsdaine & Papell - C	1988:3 2001:3	-0.62 [3]	6.92**
	Lee & Strazicich - C	2001:3	-0.33 [3]	4.72**
	Lee & Strazicich - C	1988:4 2001:3	-0.50 [3]	5.75**

The "crash" model A allows for structural break(s) in the intercept of the trend function and model C allows for structural break(s) in the intercept and slope of the trend function.

α denotes the coefficient on the time series variable at lag 1; k denotes the lag length. ***, **, * Statistically significant at the 1%, 5% and 10% confidence level respectively. The appropriate critical values for all tests are extracted from the corresponding papers.

3.1 Unit Root Analysis

This section explores the unit root properties of the Cypriot macroeconomic series under consideration. Beginning with the Dickey-Fuller (DF) test, we also implement the Perron one break exogenous unit root test, the Zivot-Andrews (ZA) and Lumsdaine-Papell (LP) endogenous DF-type unit root tests and the Lagrange multiplier (LM) unit root tests developed by Lee & Strazicich (2003a,b). Testing the unit root hypothesis under the presence of structural breaks entails two advantages. First, it increases the ability to reject a unit root when the stationary alternative is true. Second, it provides valuable information for identifying the internal or external factors that affect a Cypriot macroeconomic variable and therefore, due to the small sample, should be taken into account when constructing a model. Table 3.1 shows that the DF test can reject the unit root hypothesis for the variables "output growth rate" and "M1 growth rate" at the 1% significance level and for the variable "M2 growth level" at the 10% significance level. However, allowing for exogenous or endogenous structural breaks the unit root hypothesis can also be rejected for the other three series at the 10% significance level or better (see Table 3.2)[8]. Having in mind that the presence of structural break(s) in "M2 growth rate" fails to improve the significance of the t-statistic, we conclude that the variables "output growth rate","M1 growth rate" and "M2 growth rate" are trend stationary without breaks while the variables "unemployment rate", "inflation rate" and "t-bill rate" are trend stationary with breaks. The structural breaks in the unemployment rate, as reported in Table 3.2, are closely related to the 1986 oil price crash and the substantial declines in tourists arrivals and revenues[9] caused by the Persian Gulf War in 1991 and the crash in the European Exchange Rate Mechanism[10] in 1992. On the other hand, the structural breaks in the inflation rate occur at the end of the second oil crisis period (1979-1981) and at the time of the 1986 oil price crash. Finally, the structural breaks in the t-bill interest rate are associated with internal economic changes, such as the liberalization of interest rates in 2001. In order to capture these important structural changes, we need to include dummies in the model specification. Since the breaks might cause several effects on the trend line of the macroeconomic series, these dummy variables can take one of the following form:

$$DP(B)_t = \begin{cases} 0 & \text{otherwise} \\ 1 & \text{for} \quad t = B+1 \end{cases} \qquad DL(B)_t = \begin{cases} 0 & \text{otherwise} \\ 1 & \text{for} \quad t > B \end{cases}$$

$$DT(B)_t = \begin{cases} 0 & \text{otherwise} \\ t-B & \text{for} \quad t > B \end{cases} \qquad DLT(B)_t = \begin{cases} 0 & \text{otherwise} \\ t & \text{for} \quad t > B \end{cases}$$

where B is the breakpoint, $DP(B)_t$ is a pulse dummy variable, $DL(B)_t$ is a level dummy variable, $DT(B)_t$ allows for a change in the slope of the deterministic trend line and $DLT(B)_t$ allows for a change in both the mean and the slope of the deterministic trend line. Following the work of Christofides *et al.* (2006b), all the mentioned events are analyzed and based on t-tests and goodness of fit measures (i.e. R^2 and SSR),

[8] In all tests, we determine the optimal lag length (k) by following the general-to-specific procedure described by Perron (1989) and suggested by Ng & Perron (1995). This involves starting with a predetermined upper bound k_{max}. If the last included lag is significant, we choose k_{max}. If not, we reduce k by one until the last lag becomes significant. If no lags are significant, we set k equal to zero. As we employ quarterly data, we set k_{max} equal to 4 or 8 and we use the 10% critical value of the asymptotic normal distribution, 1.645, to assess the significance of the t-statistic on the last lag. The exogenous structural breaks used for the Perron tests reflect the most important economic and political events that potentially affect the Cypriot economy during the period of interest (see Table A.2.5 on page 36). The search for structural break(s) in the four endogenous unit root tests is carried out over the time interval $[0.1T,\ 0.9T]$ (to eliminate end-points) where T is the sample size.

[9] Statistical Service of Cyprus: Statistical Abstract 2005

[10] Pound Sterling and Italian Lira forced out the European Exchange Mechanism with direct and unpleasant effects for Cyprus, since many citizens from Italy and especially the UK prefer Cyprus for their vacations (Christofides *et al.* , 2006b).

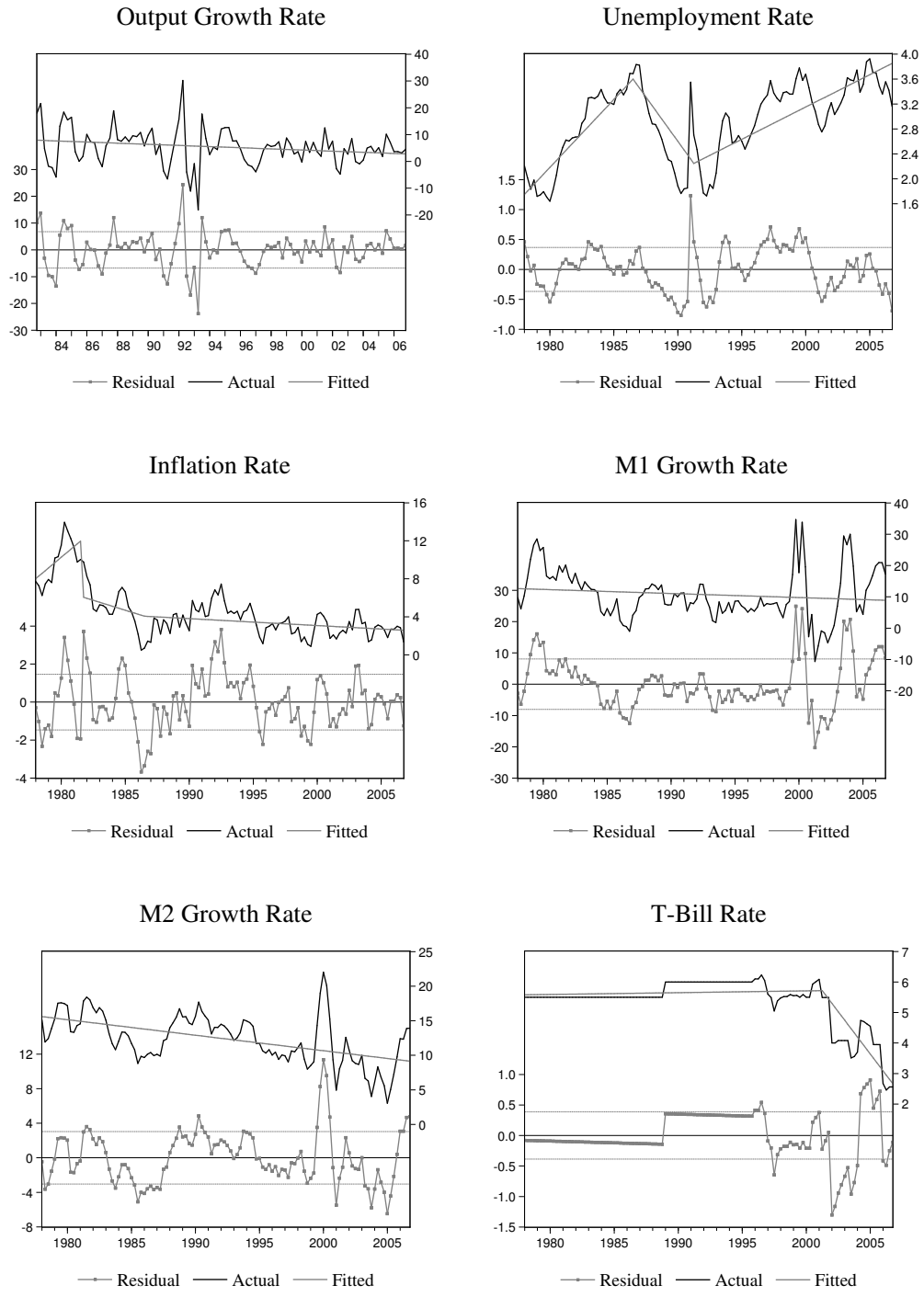

Figure 3.1: Cyprus Macroeconomic Series under Structural Changes

the breakpoints in the unemployment rate 1986:3 and 1991:1 are both best modeled by $DT(B)_t$, the breakpoints in the inflation rate 1981:4 and 1986:3 are best modeled by $DLT(B)_t$ and $DT(B)_t$ respectively and finally the breakpoint in the t-bill rate 2001:1 is best modeled by $DT(B)_t$.

Figure 3.1 shows the plot of the six macroeconomic series under consideration (dark solid lines). The light solid (broken straight) lines are the estimated trend lines from

Table 3.3: Regression Statistics for the Output Growth Rate

	$p=5$ $q=0$ $\lambda=0$	$p=5$ $q=\|4\|$ $\lambda=0$	$p=5$ $q=\|4\|$ $\lambda=1$	$p=5$ $q=\|4\|$ $\lambda=1$ plus X_1	$p=6$ $q=\|4\|$ $\lambda=1$ plus X_1
SSR	5.45	4.27	4.45	4.46	4.52
AIC	6.30	5.82	5.77	5.48	4.45
SBC	6.49	6.04	6.05	5.78	5.78
$Q(4)$	3.0 (0.54)	0.0 (0.99)	1.5 (0.66)	0.5 (0.89)	0.3 (0.95)
$Q(8)$	18.5 (0.01)	3.4 (0.83)	5.2 (0.62)	14.8 (0.03)	6.7 (0.45)
$Q(12)$	21.5 (0.04)	5.7 (0.89)	10.4 (0.49)	18.0 (0.08)	9.5 (0.57)
$Q^*(4)$	33.4 (0.00)	23.4 (0.00)	5.5 (0.13)	3.7 (0.28)	3.9 (0.26)
$Q^*(8)$	42.6 (0.00)	24.0 (0.00)	7.3 (0.39)	11.7 (0.10)	10.1 (0.17)
$Q^*(12)$	45.9 (0.00)	24.5 (0.01)	9.0 (0.61)	15.2 (0.17)	13.5 (0.25)

SSR = sum of squared residuals; AIC = Akaike Information Criterion; SBC = Schwartz Bayesian Criterion

Q(n) reports the Ljung-Box Q-statistics for the autocorrelations of the n residuals of the estimated model. Q^*(n) reports the Ljung-Box Q-statistics for the autocorrelations of the n squared residuals of the estimated model. Significance level in parentheses.

p = lag length of autoregressive component in the mean model; q = lag length of moving-average component in the mean model; λ = lag length of autoregressive component in the heteroscedastic variance model; |4| denotes that only the fourth MA term is included in the mean model; "plus $X_i : \forall i \in \{1, 2, ...\}$" denotes that an exogenous variable is included in the heteroscedastic variance model; X_{1t} is the yearly rate of change of tourists arrivals.

the following regression:

$$z_t = c + \vartheta t + \varphi_f Df(B)_t + v_t^z \tag{1}$$

where z_t is a time series variable, c is a constant, t is a linear trend, $Df(B)_t : \forall f \in \{P, L, T, LT\}$ is the structural break(s) dummy variable(s) at time B (if any) and v_t^z is the residual term. As already shown, once we allow for structural breaks to occur, the stability condition is satisfied for all six variables. Indeed, the estimated residuals $\hat{v}_t^z$ of the fitted models (grey spotted lines) appear to fluctuate around a mean of zero, which implies no deviation from the long run equilibrium. However, the large volatility of some series during particular periods suggests that we need to further analyze these variables and, if necessary, model their condition heteroscedasticity.

3.2 Model Selection

This section applies the Box-Jenkins strategy for appropriate model selection. We begin by considering plausible models for the output growth rate, denoted by y_t. The autocorrelation function (ACF) and partial autocorrelation function (PACF) of the $\hat{v}_t^y$ sequence (i.e. the estimated residual from the regression $y_t = c + \vartheta t + v_t^y$) are strongly suggestive of an AR(5) process. However, there is evidence of remaining seasonality[11] in that the value of the fourth quarter for any year is substantially higher than that of the adjacent quarters. Having estimated several seasonal models, this pattern is best captured by the inclusion of a moving-average coefficient at lag 4. As shown in Table 3.3, the ARMA(5, |4|) model is an improvement over the AR(5) specification - all goodness of fit measures select the former model to the latter one while the residuals of the ARMA(5, |4|), unlike the ones of the AR(5), do not exhibit serial correlation. On the other hand, the volatility during the early 1990s (see Figure 3.1) suggests that we

[11] Even if we use seasonally adjusted data, a seasonal pattern might remain. As Enders (2003) notes, if we do not use the entire span of data, the portion of the data used in our study can display more (or less) seasonality than the overall span.

Table 3.4: Selected Models Based on Statistical Adequacy Criteria

Output growth rate

$y_t = c + \vartheta t + \sum_{j=1}^{6} \alpha_j y_{t-j} + \varepsilon_t + \beta_4 \varepsilon_{t-4}$
$h_t = \kappa + \rho_1 \varepsilon_{t-1}^2 + \psi X_{1t}^2$

$|\sum_{j=1}^{6} \hat{\alpha}_j| < 1$; $|\hat{\beta}_4| < 1$; $R^2 = 0.59$; $Q(4) = 0.3$ (0.95); $Q(8) = 6.7$ (0.45); $Q(12) = 9.5$ (0.57);
$Q^*(4) = 3.9$ (0.26); $Q^*(8) = 10.1$ (0.17); $Q^*(12) = 13.5$ (0.25)

Unemployment rate

$u_t = c + \vartheta t + \varphi_{T_1} DT(86Q3)_t + \varphi_{T_2} DT(91Q1)_t + \alpha_1 u_{t-1} + \varepsilon_t$
$h_t = \kappa$

$|\hat{\alpha}_1| < 1$; $R^2 = 0.85$; $Q(4) = 3.8$ (0.42); $Q(8) = 6.5$ (0.58); $Q(12) = 12.6$ (0.39);
$Q^*(4) = 2.1$ (0.71); $Q^*(8) = 2.2$ (0.97); $Q^*(12) = 2.6$ (0.99)

Inflation rate

$\pi_t = c + \vartheta t + \varphi_{LT} DLT(81Q4)_t + \varphi_T DT(86Q3)_t + \sum_{j=1}^{9} \alpha_j \pi_{t-j} + \varepsilon_t + \beta_4 \varepsilon_{t-4}$
$h_t = \kappa$

$|\sum_{j=1}^{9} \hat{\alpha}_j| < 1$; $|\hat{\beta}_4| < 1$; $R^2 = 0.93$; $Q(4) = 0.0$ (0.99); $Q(8) = 2.1$ (0.95); $Q(12) = 4.8$ (0.93);
$Q^*(4) = 2.5$ (0.46); $Q^*(8) = 4.0$ (0.77); $Q^*(12) = 7.9$ (0.71)

M1 growth rate

$m1_t = c + \vartheta t + \sum_{j=1}^{3} \alpha_j m1_{t-j} + \varepsilon_t + \beta_4 \varepsilon_{t-4}$
$h_t = \kappa + \rho_1 \varepsilon_{t-1}^2 + \zeta X_{2t}^2$

$|\sum_{j=1}^{3} \hat{\alpha}_j| < 1$; $|\hat{\beta}_4| < 1$; $R^2 = 0.80$; $Q(4) = 4.3$ (0.23); $Q(8) = 9.0$ (0.25); $Q(12) = 12.0$ (0.36);
$Q^*(4) = 1.1$ (0.77); $Q^*(8) = 2.3$ (0.94); $Q^*(12) = 7.9$ (0.72)

M2 growth rate

$m2_t = c + \vartheta t + \sum_{j=1}^{4} \alpha_j m2_{t-j} + \varepsilon_t + \beta_4 \varepsilon_{t-4}$
$h_t = \kappa + \rho_1 \varepsilon_{t-1}^2 + \zeta X_{2t}^2$

$|\sum_{j=1}^{4} \hat{\alpha}_j| < 1$; $|\hat{\beta}_4| < 1$; $R^2 = 0.91$; $Q(4) = 1.5$ (0.69); $Q(8) = 11.4$ (0.12); $Q(12) = 11.8$ (0.38);
$Q^*(4) = 1.7$ (0.64); $Q^*(8) = 3.8$ (0.81); $Q^*(12) = 4.1$ (0.97)

T-bill rate

$\iota_t = c + \vartheta t + \varphi_T DT(01Q1)_t + \alpha_1 \iota_{t-1} + \varepsilon_t$
$h_t = \kappa + \rho_1 \varepsilon_{t-1}^2 + \xi X_{3t}^2$

$|\hat{\alpha}_1| < 1$; $R^2 = 0.91$; $Q(4) = 1.3$ (0.85); $Q(8) = 2.0$ (0.98); $Q(12) = 5.7$ (0.92);
$Q^*(4) = 1.3$ (0.85); $Q^*(8) = 1.7$ (0.98); $Q^*(12) = 2.5$ (0.99)

R^2=coefficient of determination; Q(n) reports the Ljung-Box Q-statistics for the autocorrelations of the n residuals of the estimated model; Q^*(n) reports the Ljung-Box Q-statistics for the autocorrelations of the n squared residuals of the estimated model. Significance level in parentheses.

α_j = the autoregressive coefficients in the mean model; β_j = the moving-average coefficients in the mean model; h_t = the conditional variance of residual term ε_t; κ = constant; $\rho_s : \forall s \in \{1, 2, ..., \lambda\}$ = the autoregressive coefficients in the conditional variance process; X_{1t} = the yearly rate of change of tourists arrivals; X_{2t} = dummy variable equal to 0 before the fourth quarter of 1999 and equal to 1 thereafter; X_{3t} = dummy variable equal to 0 before the first quarter of 2001 and equal to 1 thereafter; Note that we raise X_{it} to the power of 2, where it is always positive, to minimize the possibility that a single, large negative value generates a negative value for the variance.

also need to examine the ACF and PACF of the squared residuals. The Q^*-statistics, together with several multiplier tests for ARCH errors, confirm that there are ARCH effects in the mean model. Diagnostic tests imply that an ARCH(1) characterizes the error process. Since the probable cause for the volatile $\hat{v}_t^y$ during the early 1990s is the large fluctuations in tourists arrivals and revenues (associated with the Persian Gulf War and the crash in the European Exchange Rate Mechanism), we also consider a modification of the ARCH(1) error structure that contains the exogenous variable X_{1t}, that is, the yearly rate of change of tourists arrivals. Both these ARCH specifications remove conditional volatility (see Table 3.3) but the "ARCH(1) plus X_1" process dominates the pure ARCH(1) in terms of goodness of fit. On the other hand, the "ARCH(1) plus X_1" process results in residuals which are serially correlated. Adding an autoregressive coefficient in the mean equation is the likely solution to this problem. The ARMA(6, |4|) model with an "ARCH(1) plus X_1" process appears to be adequate - the AIC and SBC select this specifications and also, the ACF and PACF of the residuals and squared residuals do not indicate any serial correlation. Consequently, the most appropriate models for the mean and the conditional variance of the output growth rate (y_t) are:

$$y_t = c + \vartheta t + \sum_{j=1}^{6} \alpha_j y_{t-j} + \varepsilon_t + \beta_4 \varepsilon_{t-4}$$

$$h_t = \kappa + \rho_1 \varepsilon_{t-1}^2 + \psi X_{1t}^2$$

where α_j are the autoregressive coefficients in the mean equation, β_j are the moving-average coefficients in the mean equation, h_t is the conditional variance of ε_t given ε_{t-1}^2 and X_{1t}^2, κ is a constant, $\rho_s : \forall s \in \{1, 2, ..., \lambda\}$ are the autoregressive coefficients in the conditional variance process and ψ is the coefficient on X_{1t}^2, such that κ, ρ_s and ψ are always positive.

Following the same methodology, we construct the optimal models for the other five macroeconomic series (see Table 3.4). More precisely, after detrending the data and obtaining the residuals from the regression equation (1), we find that the estimated residual of the unemployment rate ($\hat{v}_t^u$) is best represented by an AR(1) model with no ARCH effects, the estimated residual of the inflation rate ($\hat{v}_t^\pi$) by an ARMA(9, |4|) model with no ARCH effects, the estimated residual of the M1 growth rate ($\hat{v}_t^{m1}$) by an ARMA(3, |4|) model with an "ARCH(1) plus X_2" process, the estimated residual of the M2 growth rate ($\hat{v}_t^{m2}$) by an ARMA(4, |4|) model with an "ARCH(1) plus X_2" process and finally the estimated residual of the t-bill rate ($\hat{v}_t^t$) by an AR(1) model with an "ARCH(1) plus X_3" process. Note that the exogenous variable X_{2t} is a dummy variable equal to 0 before the fourth quarter of 1999 and equal to 1 thereafter (to capture the volatile $\hat{v}_t^{m1}$ and $\hat{v}_t^{m2}$ during the post-1999 period associated with the 1999-2000 Cyprus Stock Market crash, the liberalization of interest rates in 2001 and the liberalization of capital movements in 2003) while the exogenous variable X_{3t} is a dummy variable equal to 0 before the first quarter of 2001 and equal to 1 thereafter (to capture the large volatility of $\hat{v}_t^t$ accompanying the liberalization of interest rates in 2001). Table 3.4 also illustrates that the selected models have all the properties of well estimated time series. In other words, they (i) have coefficients that imply stationarity and invertibility, (ii) fit the data well and (iii) have residuals that approximate a white-noise process.

3.3 Specification of Empirical Tests on Political Cycles

Two basic characteristics of the Cypriot economy are the smallness and openness of the economy, with the ratio of exports and imports of goods to GDP exceeding 50%

(Karamanou *et al.* , 2001), and the partial dependence on the tourism sector, whose total contribution[12] amounted roughly to 15-20% of GDP in the period 1990-2004 (Eurostat). These figures indicate that the world business cycle has an important impact on the Cypriot economy and explain why political behavior in Cyprus should be examined after controlling for the external economic environment. In light of these arguments and building on the analysis performed in Sections 3.1 and 3.2, we test the various theories of political cycles by running regressions of the following form:

$$z_t = \underbrace{c + \vartheta t + \varphi_f Df(B)_t + \sum_{j=1}^{p} \alpha_j z_{t-j} + \varepsilon_t + \beta_4 \varepsilon_{t-4}}_{\text{selected models as defined in Table 3.4}} + \gamma w z_t + \delta PDUM_t \tag{2}$$

$$h_t = \overbrace{\kappa + \sum_{s=1}^{\lambda} \rho_s \varepsilon_{t-s}^2 + \psi X_{it}^2} \tag{3}$$

where $PDUM_t$ is a political dummy variable reflecting the implications of different theories (see Table 3.5 for definitions of $PDUM_t$ and Table 3.6 for expected signs of δ) and wz_t is a proxy for the effect of the world economy. This proxy is obtained as a weighted average of the corresponding series of Cyprus' trading partners (IMF-IFS data) and more precisely, the US, in an effort to capture oil price variation, the UK, due to the importance of tourism from that country, and the group of Germany, France and Italy, to represent the Eurozone[13]. The trade weights used to calculate the world variables are the ones proposed by Karamanou *et al.* (2001), that is, 0.1 for the UK, 0.4 for the US and 0.5 for the Eurozone[14].

Regression equation (2) assumes that there is no high linear relationship or collinearity among explanatory variables. However, some of the structural breaks in the Cypriot macroeconomic series are likely to constitute at the same time structural breaks in the corresponding world series. In such cases, the variables $Df(B)_t : \forall f \in \{P, L, T, LT\}$ and wz_t in (2) might be highly collinear and we might face difficulties in assessing the individual effect of each explanatory variable on z_t, or its marginal contribution to R^2 (Gujarati, 1992). Applying the Chow (1960) test, we find that the breakpoint 1986:3 (as modeled in Section 3.1) is also a breakpoint in the world unemployment rate and the breakpoints 1981:4 and 1986:3 (as modeled in Section 3.1) are also breakpoints in the world inflation rate[15]. To cope with this problem, we substitute wz_t in the equations of unemployment rate and inflation rate by $\hat{v}_t^{wz}$ (i.e. the estimated residual from the regression $wz_t = c + \vartheta t + \varphi_f Df(B)_t + v_t^{wz}$). This approach allows a control for the world business cycle movement not driven by structural changes in the trend function.

[12] Derived from the value added and created, either directly, through the purchases of goods and services of tourists in various sectors of economic activity or indirectly, through the intersectoral linkages.

[13] We choose these three countries because: (i) data for the whole sample of Eurozone countries is readily available, (ii) they are considered to be the largest economies in the Eurozone in terms of contribution to the total GDP (Eurostat) and (iii) they are listed among the six major trading partners of Cyprus in the period 1990-2005 (Statistical Service of Cyprus: Statistical Abstract 2005).

[14] Karamanou *et al.* (2001) used only Germany as a representative country for the Eurozone economy. However, after experimentation, we found that calculating the average economic outcomes of Germany, France and Italy and using these variables to capture the Eurozone effects yields better statistical results.

[15] Also, regressing these world variables on a constant, a linear trend and the corresponding structural breaks and testing the significance of the resulting R^2, provides us with sufficient evidence about the existence of multicollinearity.

Table 3.5: Political Dummy Variables

$FPTN_t$, $SPTN_t$, ADM_t: partisan dummy variables
$PREN_t$, $POSTN_t$: electoral (opportunistic) dummy variables

$$FPTN_t = \begin{cases} +1 & \text{in the N quarters starting with a right government} \\ +\frac{1}{2} & \text{in the N quarters starting with a center-right government} \\ -\frac{1}{2} & \text{in the N quarters starting with a center-left government} \\ -1 & \text{in the N quarters starting with a left government} \\ 0 & \text{otherwise} \end{cases}$$

$$SPTN_t = \begin{cases} +1 & \text{during right governments after the first N quarters} \\ +\frac{1}{2} & \text{during center-right governments after the first N quarters} \\ -\frac{1}{2} & \text{during center-left governments after the first N quarters} \\ -1 & \text{during left governments after the first N quarters} \\ 0 & \text{otherwise} \end{cases}$$

$$ADM_t = \begin{cases} +1 & \text{if a right government is in office, including the quarter of the government change} \\ +\frac{1}{2} & \text{if a center-right government is in office, including the quarter of the government change} \\ 0 & \text{if a center government is in office, including the quarter of the government change} \\ -\frac{1}{2} & \text{if a center-left government is in office, including the quarter of the government change} \\ -1 & \text{if a left government is in office, including the quarter of the government change} \end{cases}$$

$$PREN_t = \begin{cases} +1 & \text{in the N-1 quarters preceding an election and in the election quarter} \\ 0 & \text{otherwise} \end{cases}$$

$$POSTN_t = \begin{cases} +1 & \text{in the N-1 quarters following an election and in the election quarter} \\ 0 & \text{otherwise} \end{cases}$$

$FPTN_t$ and $SPTN_t$ capture the **f**irst **p**art and **s**econd **p**art **t**ransitory differences between different administrations; ADM_t captures the permanent differences between different **adm**inistrations; $PREN_t$ captures the **pre**electoral effects; $POSTN_t$ captures the **post**electoral effects.

Table 3.6: Expected Signs of Coefficients

Variable	$FPTN_t$	$SPTN_t$	ADM_t	$PREN_t$	$POSTN_t$
Output growth rate	$(-)$	$(-)^\star$	$(-)$	$(+)$	
Unemployment rate	$(+)$	$(+)^\star$	$(+)$	$(-)$	
Inflation rate			$(-)$		$(+)$
Money growth rates			$(-)$	$(+)$	$(-)$
Interest rates			$(-)$	$(-)$	$(+)$

* If the traditional partisan theory view is correct $SPTN_t$ should be statistically significant; if the rational partisan theory view is correct $SPTN_t$ should be statistically insignificant (with or without the correct sign).

4 Evidence on Political Cycles in Economic Outcomes

4.1 Partisan Effects on Output Growth and Unemployment Rates

We start with tests of the traditional partisan theory, which implies permanent differences in output growth and unemployment across governments. To do so, we run regressions using the "permanent" political dummy ADM_t[16]. Column (1) in Table 4.1 reports the results of the output growth regression and presents evidence in favor of the traditional partisan hypothesis: the coefficient on ADM_t[17] has the correct sign and is statistically significant at the 10% confidence level. However, this result may be misleading in the sense that it can be driven by strong first-part transitory effects. To test whether the rational partisan theory view is correct we run the same regression using the "transitory" political dummy $FPTN_t$ and its complement $SPTN_t$. We consider $N = 4, 6, 8$ to capture the idea that transitory output growth effects might last between one and two years[18]. One important implication of this theory is that the size of real effects depends on the degree of policy surprise. Therefore, coding each coalition reshuffling as a surprise would overestimate the amount of uncertainty and that's why the political dummies $FPTN_t$ and $SPTN_t$ take into account only the government changes occurred in elections (conditional that the new government, or coalition government, remains the same for at least two years). Columns (2) through (4) show the corresponding results and confirm that the effects of government changes on output growth are transitory rather than permanent: the coefficients on all political dummies have the correct sign but only the $FPTN_t$ dummies are statistically significant (at the 10% confidence level or better). The pattern of estimates suggests that two years after a change to a right (left) government, the output growth rate is about 0.7% below (above) its long-term equilibrium value[19]. This estimate is about half of the one reported in Alesina & Rosenthal (1995) and Alesina *et al.* (1997) for the US during the period 1947-1993 and for a group of OECD countries during the period 1960-1993. It worths mentioning that the moving-average term in Table 4.1 is not induced by overlapping observations. Taking as dependent variable the quarterly change of real GDP, instead of the yearly one, and running the same regressions as before, does not change the economic and statistical significance of the estimated coefficient on ε_{t-4} (nor the one on the political dummies)[20].

Tests on the unemployment rate yield very similar results. Columns (1) through (4) in Table 4.2 illustrate analogous patterns to the ones displayed in Table 4.1 for the output growth rate[21]. In terms of statistical significance, all $FPTN_t$ dummies have higher t-statistic (approximately 3.00) but in terms of economic significance, the magnitude of the effects is substantially lower. Specifically, the estimated coefficients imply that two years after a change to a right (left) government, the unemployment rate

[16]Note that changes in this dummy and election dates do not always coincide, since the government's partisan orientation may alter at any time after the elections (for instance, when a party pulls out of coalition government).

[17]The first quarter lag in the political dummy captures the reasonable interval between the change in regime and the change in policy.

[18]The choice of number of quarters is consistent with a wage contract model in which contracts have an average length of one or two years.

[19]The long-term equilibrium for output growth y^* is computed as follows:
$(1 - \sum_j^6 \hat{\alpha_j})y^* = \hat{c} - \hat{\delta} RPT8_t \Rightarrow 0.64y^* = 2.14 - 1.12RPT8_t \Rightarrow y^* = 3.34 - 1.75RPT8_t$
Having in mind that the partisan dummy goes to zero after eight quarters, we multiply 1.75 by $\frac{8}{20}$ to get the value reported in the text.

[20]This result also applies to the other growth rates regressions presented later in this analysis.

[21]Consistent results are obtained if the political dummies are lagged two quarters to capture slower response of unemployment to policy changes.

Table 4.1: Partisan Theories: Output Growth Rate

Dependent Variable: Output Growth Rate (y)							
Method: Maximum Likelihood - ARCH (errors normally distributed)							
	Traditional	Rational					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
						pre-2003	
t	-0.01	-0.01	-0.01*	-0.01*	0.004	-0.02	-0.002
	(1.27)	(1.63)	(1.79)	(1.67)	(0.39)	(0.65)	(0.19)
y(-1)	0.38***	0.37***	0.37***	0.34***	0.36***	0.36***	0.29***
	(4.02)	(3.73)	(3.60)	(3.50)	(3.85)	(3.32)	(2.75)
wy	0.65**	0.66**	0.64**	0.78**	0.23	0.90**	0.91***
	(2.03)	(2.09)	(2.09)	(2.42)	(0.64)	(2.20)	(2.89)
ADM(-1)	-0.58**						
	(2.34)						
$FPT4$(-1)		-1.37*					
		(1.71)					
$SPT4$(-1)		-0.26					
		(0.87)					
$FPT6$(-1)			-1.06*				
			(1.81)				
$SPT6$(-1)			-0.22				
			(0.77)				
$FPT8$(-1)				-1.12**	-0.74*	-1.85**	-2.63***
				(2.34)	(1.71)	(2.20)	(3.61)
$SPT8$(-1)				-0.02	0.21	0.23	-0.06
				(0.07)	(0.55)	(0.27)	(0.14)
$\partial FPT8$(-1)							5.36**
							(2.28)
$\partial SPT8$(-1)							0.88
							(0.89)
X_1					0.13***		
					(4.11)		
ε(-4)	-0.97***	-0.97***	-0.97***	-0.97***	-0.97***	-0.97***	-0.97***
	(93.87)	(93.57)	(93.34)	(93.38)	(104.58)	(71.26)	(87.52)
Variance Equation							
ε^2(-1)	0.21	0.20	0.19	0.22	0.25	0.19	0.17
	(1.14)	(1.15)	(1.08)	(1.47)	(1.17)	(1.12)	(1.03)
X_1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	(1.40)	(1.33)	(1.27)	(1.21)	(1.30)	(1.12)	(1.16)
R^2	0.62	0.62	0.61	0.63	0.66	0.63	0.63

Columns report estimated coefficients (z-statistics). For brevity, constants and autoregressive coefficients at lags 2-6 are not displayed. Equations estimated using Bollerslev-Wooldrige robust standard errors and covariance. The no ARCH and no Serial Correlation hypotheses are accepted in all equations. X_1 denotes the yearly rate of change of tourists arrivals. ***,**,* Statistically significant at the 1%, 5% and 10% confidence level respectively.

is about 0.2% below (above) normal. The corresponding figure for the US and a group of OECD countries is 1.6% and 1.3% respectively[22] (Alesina *et al.* , 1997).

As discussed in Section 3, the substantial fluctuations in tourism demand during the early 1990s are responsible for structural changes in the unemployment rate and volatility clustering in the output growth rate. Hence, in order to test the robustness of the results, we add to our basic regression (with $FPT8_t$) the variable X_{1t} (i.e. the growth rate of tourists arrivals). As shown in Column (5) of Table 4.1 and Table 4.2 the estimated coefficients on the partisan dummy $FPT8_t$ remain statistically significant

[22]Note that the average unemployment rate of Cyprus in the sample is 3.0% while, for instance, the average unemployment rate of the US in the sample is 5.8%.

Table 4.2: Partisan Theories: Unemployment Rate

Dependent Variable: Unemployment Rate (u)
Method: Least Squares

	Traditional	Rational					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
						pre-2003	
t	0.01*	0.01**	0.01**	0.01**	0.01*	0.01**	0.01**
	(1.68)	(2.00)	(2.02)	(2.08)	(1.72)	(2.13)	(2.45)
$DT(86Q3)$	-0.03***	-0.03***	-0.03***	-0.04***	-0.04**	-0.04***	-0.04***
	(2.99)	(3.23)	(3.31)	(3.40)	(2.50)	(3.49)	(3.80)
$DT(91Q1)$	0.03**	0.03***	0.03***	0.03***	0.04***	0.04***	0.04***
	(3.60)	(3.84)	(4.08)	(4.31)	(3.02)	(4.24)	(4.95)
u(-1)	0.67***	0.67***	0.66***	0.65***	0.62***	0.63***	0.62***
	(10.12)	(9.82)	(9.44)	(8.76)	(6.27)	(8.00)	(8.14)
$\hat{v}^{wu}$	0.11***	0.10***	0.10***	0.10***	0.09***	0.09***	0.09***
	(4.32)	(4.03)	(3.97)	(4.00)	(3.47)	(3.44)	(3.61)
ADM(-1)	0.08*						
	(1.96)						
$FPT4$(-1)		0.13***					
		(3.00)					
$SPT4$(-1)		0.06					
		(1.43)					
$FPT6$(-1)			0.13***				
			(3.00)				
$SPT6$(-1)			0.06				
			(1.16)				
$FPT8$(-1)				0.13***	0.13***	0.18**	0.18***
				(3.28)	(2.73)	(2.35)	(3.75)
$SPT8$(-1)				0.04	0.02	0.04	0.04
				(0.76)	(0.43)	(0.38)	(0.62)
$\partial FPT8$(-1)							-0.30*
							(1.69)
$\partial SPT8$(-1)							0.18**
							(2.08)
X_1					-0.01*		
					(1.95)		
R^2	0.88	0.88	0.88	0.88	0.90	0.87	0.88

Columns report estimated coefficients (t-statistics). Constant is not displayed. Equations estimated using White heteroskedasticity-consistent standard errors and covariance. The no ARCH and no Serial Correlation hypotheses are accepted in all equations. X_1 denotes the yearly rate of change of tourists arrivals. ***,**,* Statistically significant at the 1%, 5% and 10% confidence level respectively.
$\hat{v}^{wu}$ represents the estimated residual from the regression $wu_t = c + \vartheta t + \varphi_{T_1} DT(86Q3) + v_t^{wu}$

after controlling for this parameter[23].

4.1.1 Partisan Effects over time: the impact of EMU

In preparing for EU accession and participation in the ERM II, Cyprus has, since 2001, witnessed a stream of important structural reforms (Syrichas & Karamanou, 2004). First, in January 2001 the statutory interest rate ceiling was abolished and all restrictions on medium and long-term borrowing by Cypriots were relaxed. In July 2002, a new law came into effect which ensures the Central Bank's independence and the

[23]Note that tourists arrivals and revenues are highly correlated and that the income from tourism is one of the components of GDP. Therefore, controlling for X_{1t} produces results that involve a tautological element and marginally affects both the value of the coefficients and the t-statistics on the political dummies (column (5) of Table 4.1).

compatibility with the relevant provisions of the European Central Bank. Becoming a member of the EU in 2004, Cyprus has also been affected by the EMU not only in terms of experiencing a direct economic impact through economic linkages, but also in terms of having to adjust its policies, with the ultimate goal of meeting the Maastricht criteria. In other words, the new elected government (in February 2003) faced the challenge to pursue policies being shaped by developments in Europe and not by own partisan preferences. It is therefore quite interesting to test whether political cycles have been mitigated in the last 4 years. Column (6) in Table 4.1 and Table 4.2 presents the results of regressions similar to those in column (4), but for the pre-2003 sample period instead of the entire sample period. The evidence suggests that the partisan manipulation of the economy was more systematic before 2003: the findings for the pre-2003 sample period are stronger than the ones for the entire sample period in terms of the economic significance of the political dummy $FPT8_t$. To test whether this result can by explained be reversed partisan effects in the post-2003 period, we augment the original regression (reported in column (4)) with the interaction terms $\partial FPT8_t$ and $\partial SPT8_t$, capturing the transitory partisan effects in the last 4 years of our sample[24]. As shown in column (7) of Table 4.1 and Table 4.2, the variable $\partial FPT8_t$ enters the regressions highly significant and with the opposite sign, confirming our speculations. Alternative specifications with $\partial FPT4_t$ and $\partial FPT6_t$, and using 2001 or 2002, instead of 2003, as the year of shift to a less partisan oriented regime, lead to the same conclusions.

4.2 Partisan Effects on Inflation Rate

We continue by applying the same tests on the inflation rate. Both partisan theories imply permanent differences in inflation across governments and thus, we run regressions using only the permanent political dummy ADM_t[25]. The results for the entire sample period, presented in column (1) of Table 4.3, provide weak evidence in favor of the partisan theory hypothesis: although the coefficient on ADM_t has the expected sign, it is not statistically and economically significant. As discussed in the previous section, the new elected government in 2003, although classified as center-left, had to show a great concern for the inflationary consequences of discretionary policy-making and commit to anti-inflation policies aspired by EMU and the Maastricht criteria. Having that in mind, the reported insignificant results might have been driven by strongly reversed partisan effects in the last 4 years. Indeed, when we add to the regression the interaction term ∂ADM_t, the estimated coefficient on ADM_t becomes statistically significant and retains its negative sign while the one on ∂ADM_t[26] appears to be statistically significant and have the opposite sign (see column (2)). Moreover, restricting the sample to include the pre-2003 period and running the original regression, improves the results and validates, once again, the hypothesis that, before 2003, inflation rates were higher during left administrations. Specifically, the estimated magnitude of the effect in column (3) implies that, the difference in the long-term equilibrium inflation rate between a left and a right government is about 1.6%. Alesina *et al.* (1997) reports that the corresponding difference in the US is 1.8% and in a group of OECD countries 1.1%. In order to test how the convergence of the Cypriot inflation rates with those in the Eurozone has influenced partisan differences over time, we replace the world variable $\hat{v}_t^{w\pi}$ in column (1) with

[24] $\partial FPT8_t = FPT8_t * DL(03Q1)$ and $\partial SPT8_t = SPT8_t * DL(03Q1)$, where $DL(03Q1)$ is a level dummy variable for the post-2003 period.

[25] The third quarter lag in the political dummy captures the delay between administration change, change in policy, and effect of policy on the inflation rate.

[26] $\partial ADM_t = ADM_t * DL(03Q1)$, where $DL(03Q1)$ is a level dummy variable for the post-2003 period.

Table 4.3: Partisan Theories: Inflation Rate

Dependent Variable: Inflation Rate (π) Method: Least Squares							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			pre-2003		pre-2001	pre-2002	pre-2003
t	0.12**	0.07	0.08	0.10*	0.08*	0.10*	0.07
	(2.11)	(1.39)	(1.51)	(1.85)	(1.74)	(1.99)	(1.45)
$DLT(81Q4)$	-0.08*	-0.08**	-0.11**	-0.13***	-0.13***	-0.15***	-0.14***
	(1.88)	(2.04)	(2.39)	(2.80)	(2.81)	(2.85)	(2.75)
$DT(86Q3)$	-0.03*	0.02	0.04	0.04	0.05**	0.04*	0.06**
	(1.84)	(1.07)	(1.60)	(1.60)	(2.19)	(1.95)	(2.61)
π(-1)	0.84***	0.79***	0.73***	0.69***	0.73***	0.72***	0.66***
	(7.93)	(7.08)	(6.29)	(5.93)	(6.06)	(5.90)	(5.51)
$\hat{v}^{w\pi}$	0.25**	0.21**	0.20*	0.31***			
	(2.13)	(2.00)	(1.83)	(2.71)			
$\hat{v}^{e\pi}$					0.22*	0.27**	0.29**
					(1.73)	(2.34)	(2.60)
ADM(-3)	-0.02	-0.40***	-0.61***	-0.54***	-0.51***	-0.35*	-0.33*
	(0.17)	(3.18)	(3.98)	(3.50)	(2.72)	(1.96)	(1.89))
∂ADM(-3)		1.72***					
		(3.71)					
$(\pi - s)$				0.12**			
				(2.32)			
ε(-4)	-0.95***	-0.96***	-0.93***	-0.93***	-0.98***	-0.95***	-0.93***
	(59.04)	(53.29)	(36.19)	(30.28)	(64.08)	(61.68)	(36.18)
R^2	0.94	0.95	0.95	0.95	0.96	0.96	0.95

Columns report estimated coefficients (t-statistics). For brevity, constants and autoregressive coefficients at lags 2-9 are not displayed. Equations estimated using White heteroskedasticity-consistent standard errors and covariance. The no ARCH and no Serial Correlation hypotheses are accepted in all equations. X_1 denotes the yearly rate of change of tourists arrivals. ***,**,* Statistically significant at the 1%, 5 % and 10 % confidence level respectively.

$\hat{v}^{w\pi}$ represents the estimated residual from the regression $w\pi_t = c + \vartheta t + \varphi_{LT} DLT(81Q4) + \varphi_T DT86Q3 + v_t^{w\pi}$;
$\hat{v}^{e\pi}$ represents the estimated residual from the regression $e\pi_t = c + \vartheta t + \varphi_{LT} DLT(81Q4) + \varphi_T DT86Q3 + v_t^{e\pi}$

the Eurozone variable $\hat{v}_t^{e\pi}$[27] and run the same regression for the pre 2001, 2002 and 2003 periods. Columns (5) through (7) provide the results and confirm the expected inversely proportional relationship: as the impact of the Eurozone inflation rates on the domestic ones increases, partisan differences become less pronounced, that is, as the coefficient value and the t-statistic on $\hat{v}_t^{e\pi}$ improve over time, the coefficient value and the t-statistic on ADM_t become less significant. A similar trend is observed for the next 4 years until the partisan effects vanish completely in the fourth quarter of 2006.

A crucial issue of robustness concerns the impact of wage expansion in the inflation process. Wage growth in Cyprus is associated with the backward-looking wage indexation, which has characterized the economy since 1960 (Karamanou *et al.* , 2001). The Cost of Living Allowance (CoLA system) adjusts wages semi-annually for the past six months change in consumer prices. This further increases inflationary pressures caused by CPI components[28]. To control for the latter, we add to the regression of column (3) the variable $(\pi - s)_t$ representing the difference between inflation and nominal wage growth. As shown in column (4), the significance of the partisan dummy re-

[27]Due to the high correlation coefficient between the Cypriot and the German inflation rates in the last decade, we set the Eurozone variable $e\pi$ equal to the inflation of Germany. However, using the average rates of Germany, France and Italy as a proxy to the Eurozone rates leads to the same outcomes.

[28]In a study of inflation in Cyprus for the period 1960-1993, Kontolemis (1993) identifies as the two most important sources of inflation imported inflation and the inflexible labor market (i.e., the fully indexed wage system).

Table 4.4: Opportunistic Theories: Economic Outcomes

Output growth rate

(1) Full Sample

$$\hat{y}_t = \underset{(1.65)}{-0.01}\, t + \underset{(3.46)}{0.34}\, y_{t-1} + \underset{(2.51)}{0.79}\, wy_t + \underset{(0.22)}{0.27}\, PRE4_t - \underset{(2.44)}{1.15}\, FPT8_{t-1} - \underset{(91.60)}{0.97}\, \varepsilon_{t-4}$$

$$\hat{h}_t = \underset{(1.55)}{0.23}\, \varepsilon^2_{t-1} + \underset{(1.19)}{0.01}\, X^2_{1t} \qquad R^2\text{=}0.62$$

(2) Pre-2003 Sample

$$\hat{y}_t = \underset{(0.83)}{-0.01}\, t + \underset{(3.55)}{0.39}\, y_{t-1} + \underset{(2.48)}{0.91}\, wy_t + \underset{(0.77)}{0.95}\, PRE4_t - \underset{(1.99)}{1.71}\, FPT8_{t-1} - \underset{(74.77)}{0.97}\, \varepsilon_{t-4}$$

$$\hat{h}_t = \underset{(1.09)}{0.20}\, \varepsilon^2_{t-1} + \underset{(1.16)}{0.01}\, X^2_{1t} \qquad R^2\text{=}0.62$$

Unemployment rate

(3) Full Sample

$$\hat{u}_t = \underset{(1.64)}{0.01}\, t - \underset{(2.96)}{0.03}\, DT(86Q3)_t + \underset{(3.98)}{0.04}\, DT(91Q1)_t + \underset{(7.58)}{0.64}\, u_{t-1} + \underset{(4.73)}{0.12}\, \hat{v}^{wu}_t - \underset{(1.83)}{0.09}\, PRE4_t + \underset{(3.10)}{0.13}\, FPT8_{t-1}$$

R^2=0.88

(4) Pre-2003 Sample

$$\hat{u}_t = \underset{(1.80)}{0.01}\, t - \underset{(3.39)}{0.04}\, DT(86Q3)_t + \underset{(4.59)}{0.04}\, DT(91Q1)_t + \underset{(7.21)}{0.62}\, u_{t-1} + \underset{(4.15)}{0.11}\, \hat{v}^{wu}_t - \underset{(2.11)}{0.10}\, PRE4_t + \underset{(2.50)}{0.14}\, FPT8_{t-1}$$

R^2=0.88

Inflation rate

(5) Full Sample

$$\hat{\pi}_t = \underset{(2.18)}{0.13}\, t - \underset{(2.07)}{0.10}\, DLT(81Q4)_t - \underset{(1.61)}{0.03}\, DT(86Q3)_t + \underset{(7.50)}{0.85}\, \pi_{t-1} + \underset{(2.05)}{0.26}\, \hat{v}^{w\pi}_t + \underset{(0.77)}{0.20}\, POST4_t - \underset{(0.44)}{0.06}\, ADM_{t-3} - \underset{(27.91)}{0.95}\, \varepsilon_{t-4} \qquad R^2\text{=}0.94$$

(6) Full Sample (with shorter-lived postelectoral effects)

$$\hat{\pi}_t = \underset{(2.26)}{0.13}\, t - \underset{(2.12)}{0.10}\, DLT(81Q4)_t - \underset{(1.66)}{0.03}\, DT(86Q3)_t + \underset{(7.78)}{0.86}\, \pi_{t-1} + \underset{(2.14)}{0.24}\, \hat{v}^{w\pi}_t + \underset{(1.14)}{0.10}\, POST2_t - \underset{(0.80)}{0.09}\, ADM_{t-3} - \underset{(26.83)}{0.95}\, \varepsilon_{t-4} \qquad R^2\text{=}0.94$$

(7) Pre-2003 Sample

$$\hat{\pi}_t = \underset{(1.57)}{0.09}\, t - \underset{(2.40)}{0.11}\, DLT(81Q4)_t + \underset{(1.31)}{0.03}\, DT(86Q3)_t + \underset{(6.14)}{0.73}\, \pi_{t-1} + \underset{(1.79)}{0.23}\, \hat{v}^{w\pi}_t + \underset{(0.66)}{0.18}\, POST4_t - \underset{(3.30)}{0.57}\, ADM_{t-3} - \underset{(36.78)}{0.93}\, \varepsilon_{t-4} \qquad R^2\text{=}0.95$$

t-statistics in parenthesis. For brevity, constants and autoregressive coefficients are not displayed. Equations (1) and (2) estimated using Bollerslev-Wooldrige robust standard errors and covariance. Equations (3) through (6) estimated using White heteroskedasticity-consistent standard errors and covariance. The no ARCH and no Serial Correlation hypotheses are accepted in all equations. X_{1t} denotes the yearly rate of change of tourists arrivals.

$\hat{v}^{wu}$ represents the estimated residual from the regression $wu_t = c + \vartheta t + \varphi_{T_1} DT(86Q3) + v^{wu}_t$

$\hat{v}^{w\pi}$ represents the estimated residual from the regression $w\pi_t = c + \vartheta t + \varphi_{LT} DLT(81Q4) + \varphi_T DT86Q3 + v^{w\pi}_t$

mains unchanged, both statistically and economically, after controlling for this variable. Alternative tests with lags on $(\pi - s)_t$ reveal no modification of the results.

4.3 Opportunistic Effects

The "political business cycle" implies preelectoral manipulation of the economy (output growth rates above normal and unemployment below normal) in the year or two before an election and a postelectoral upward jump in inflation in the year or two after an election. To test this theory we run regressions using the electoral dummies $PREN_t$ and $POSTN_t$ for $N = 4$ and applying the estimation methods of the previous section. In the case of the output growth and inflation regressions, the coefficients on the political dummies have the expected sign (see equations (1) and (5) in Table 4.4) but they are not statistically significant even when partisan effects are not held constant. Alternative specifications with $N = 6, 8$, controlling for tourists arrivals and oil price variation, and

restricting the sample to the pre-2003 period (see equations (2) and (7)), fail to show any evidence on opportunistic effects in output growth and inflation. However, in the case of the unemployment regressions (see equations (3) and (4)), the coefficients on $PRE4_t$ are of the right sign and are statistically significant at conventional levels of significance[29]. The value of the coefficient implies that one year before an election the unemployment rate is 0.3% below its long-term equilibrium value. This effect, probably associated with a preelectoral increase in the number of fixed term contact workers, is relatively small and hence it is not surprising that is not accompanied by a systematic opportunistic cycle in output growth and inflation à la Nordhaus.

In order to test the rational opportunistic theory we run inflation regressions using the electoral dummy $POST2_t$ because this theory implies a shorter-lived postelectoral rise in inflation[30]. The estimated coefficient on $POST2_t$ (see equation (6)) is statistically insignificant but it has a higher t-statistic than the one on $POST4_t$. This provides evidence, although weak, that around elections policy instruments may be manipulated leading to short-lived effects on inflation, as implied by Rogoff & Sibert (1988) and Rogoff (1990).

4.4 Conclusions

Section 4 investigates whether partisan and opportunistic motivations play significant roles in the determination of economic outcomes, in a small open economy such as Cyprus. Contrary to some belief, the empirical analysis clearly reveals the existence of political cycles in the Cypriot economy despite its openness to international trade and its susceptibility to external factors. Specifically, during the period 1978-2003, we find evidence in support of the rational partisan model: growth is temporarily higher than normal and unemployment temporarily lower than normal for about two years after an electoral victory of the left while inflation is permanently higher when the left is in office - relative to when the right is in office. Moreover, we find hardly any evidence in favor of a systematic opportunistic cycle of the Nordhaus type. These results are remarkably consistent with those obtained by Alesina *et al.* (1997) for the United States and other industrial countries, even though the dimension of partisan effects is not as large, especially in growth and unemployment. It seems that politicians in a small open economy lack some degree of freedom in the conduct of macroeconomic policies but eventually they manage to influence economic outcomes according to their preferences.

Section 4 also explores whether the reported partisan effects on economic outcomes survive inside the EU and the ERM II. It turns out that the implementation of several structural reforms and the need to fulfill the Maastricht criteria have affected the ability of the government to manipulate the economy according to its partisan preferences. More precisely, we find that when we take into account the last 4 years of our sample, the existing partisan differences in output growth and unemployment become less pronounced while the ones in inflation vanish completely. The impact on each variable seems to be associated with the degree of convergence with the corresponding variable in the Eurozone. As Hasapis (2007) shows, there is absolute convergence in inflation rates and exchange rates and partial convergence in other macroeconomic series.

[29] These results are also robust to variations in model specification.

[30] Note that the rational opportunistic models predict no multiyear cycle in output growth and unemployment.

5 Evidence on Political Cycles in Policy Instruments

5.1 Monetary Policy

We now turn to monetary policy. In the case of Cyprus, the monetary transmission mechanism works via different channels. As Karamanou *et al.* (2001) point out, interest rate changes affect real variables through the standard interest rate channel, supported by the existence of sticky prices and wage rigidities, while the importance of bank intermediated credit as a source of funds makes the credit channel significant. Karamanou *et al.* (2001) also explain that capital controls and imperfect substitutability of domestic and foreign assets along with a target zone regime create a channel for monetary policy to affect output and prices despite a fixed exchange rate system[31]. It worths noting that in 1996 the Central Bank of Cyprus (CBC) moved away from the use of direct instruments for monitoring liquidity in the economy (such as minimum reserve requirements and credit growth ceilings) in favor of market-based tools and that in the pre-2001 period a statutory interest rate ceiling existed. In light of these facts, it is not theoretically obvious which instrument we should include in our empirical tests and hence, following Alesina *et al.* (1997), we take the approach of deriving the implications of various political theories using several instruments. More precisely, we use the growth rates of two monetary aggregates, one that is more closely controllable by the CBC (M1) and a wider one (M2), and two short-term interest rates, one that is determined by the CBC (retail bank marginal lending rate) and one that is market determined (3-month treasury bill rate)[32].

We begin with tests on the growth rates of monetary aggregates ($m1$ and $m2$) assuming that the monetary policy follows a rule similar to that of Taylor (1993). In other words, we add to the basic regression equation (2) (page 12) a term for lagged inflation (π_{t-4}) and a term for lagged output growth gap[33] ($ygap_{t-4}$) to capture the idea that the monetary policy adjusts whenever output growth gap and inflation deviate from their respective long run equilibrium levels. Alesina (1988) and Alesina *et al.* (1997) estimate an analogous reaction function for the US, using only the lagged output growth rate (or the lagged unemployment rate) as the measure of business cycle conditions. Having in mind that monetary policy decisions in Cyprus are also affected by the world business cycle, we reconcile Alesina's approach and Taylor's rule by replacing π_{t-4} with $w\pi_{t-4}$, i.e. the lagged world inflation[34]. According to this specification when the divergence of output growth from its trend value and the world inflation increase, monetary policy becomes tighter than otherwise, because the monetary authority tries to avoid rise in domestic inflation. Note that we use the fourth quarter lag in $w\pi$ and $ygap$ because the dependent variable (money growth rate) reflects changes on a yearly basis[35].

[31] The Central Bank of Cyprus has, since 1967, pursued a stable exchange rate policy pegging the local currency to different anchor currencies.

[32] Note that we could also test for the presence of political cycles in bank credit. However, a cursory look at the yearly rate of growth of this measure reveals that it is extremely volatile in some periods and hence we chose not to use it as a monetary policy instrument - even though by doing so we can obtain results consistent with the partisan theory hypothesis.

[33] The output growth gap is calculated applying a Hodrick-Prescott filter to real GDP growth rate and subtracting the estimated trend from the real GDP growth rate.

[34] Including both terms in the regression equation might cause problems of multicollinearity.

[35] Regressing the two monetary growth rates on four lags of $w\pi$ and $ygap$ suggests that the chosen specification is correct since the individual effects become significant through time and the sum of individual coefficients is negative. Specifically, in the first and second quarter there is no or small impact while in the third and fourth quarter there are significant effects with the negative ones dominating.

Table 5.1: Political Cycles Theories: Monetary Aggregates Growth Rates

Dependent Variable: M1 Growth Rate ($m1$) (columns (1), (3), (5), (7), (9), (11)); M2 Growth Rate ($m2$) (columns (2), (4), (6), (8), (10), (12))
Method: Maximum Likelihood - ARCH (errors normally distributed)

	Partisan Theories								Opportunistic Theories			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
							Pre-2003				Pre-2003	
t	0.01	-0.01***	0.01	-0.01***	0.004	-0.01***	-0.02	-0.01	0.004	-0.01***	-0.02	-0.01
	(0.67)	(3.44)	(0.51)	(3.84)	(0.46)	(3.72)	(1.51)	(1.59)	(0.48)	(3.14)	(1.58)	(1.52)
$m1$(-1)	0.91***		0.76***		0.86***		0.88***		0.90***		0.86***	
	(9.42)		(6.96)		(8.34)		(7.58)		(9.15)		(7.93)	
$m2$(-1)		1.17***		1.06***		1.14***		1.06***		1.17***		1.04***
		(10.84)		(10.13)		(10.41)		(10.49)		(10.87)		(10.54)
$w\pi$(-4)	-0.76**	-0.36***	-0.81**	-0.34***	-0.81**	-0.34***	-1.11***	-0.42***	-0.84**	-0.34***	-1.18***	-0.40***
	(2.26)	(3.55)	(2.24)	(3.50)	(2.48)	(3.69)	(3.37)	(4.00)	(2.28)	(3.12)	(3.07)	(3.50)
$ygap$(-4)	-0.08**	0.01	-0.08*	-0.004	-0.08*	0.01	-0.06**	-0.01	-0.09**	0.01	-0.07**	-0.01
	(1.98)	(0.42)	(1.95)	(0.26)	(1.95)	(0.42)	(2.36)	(0.71)	(2.20)	(0.54)	(2.29)	(0.58)
ADM(-2)	-1.25**	-0.42***	-1.35**	-0.53***	-1.30***	-0.42***	-1.37***	-0.70***	-1.35**	-0.40***	-1.46***	-0.65**
	(2.44)	(3.78)	(2.37)	(4.01)	(2.59)	(3.76)	(4.06)	(2.78)	(2.49)	(3.52)	(3.49)	(2.08)
$PRE4$									-0.55	0.17	-0.56	0.22
									(0.72)	(0.65)	(0.80)	(0.65)
$\overline{se}$			0.02	0.01**								
			(1.41)	(2.52)								
Δr_L					-1.73	-0.59						
					(2.03)	(1.61)						
ε(-4)	-0.95***	-0.95***	-0.94***	-0.94***	-0.95***	-0.95***	-0.97***	-0.92***	-0.95***	-0.97***	-0.97***	-0.92***
	(54.64)	(39.97)	(56.57)	(48.42)	(61.60)	(37.37)	(89.59)	(29.43)	(55.83)	(39.58)	(81.15)	(29.84)
						Variance Equation						
ε^2(-1)	0.45**	0.17	0.25*	0.10	0.41**	0.12	1.03***	0.36*	0.44**	0.16	1.01***	0.38*
	(2.14)	(1.21)	(1.94)	(0.70)	(2.36)	(0.86)	(2.79)	(1.82)	(2.10)	(1.19)	(2.59)	(1.85)
X_2	0.66	0.94**	16.18*	1.19***	14.75	1.05**	0.66	0.57	10.70	0.97**	1.01	0.54
	(1.39)	(2.09)	(1.83)	(2.84)	(1.61)	(2.41)	(0.34)	(1.49)	(1.40)	(2.13)	(0.45)	(1.42)
R^2	0.80	0.92	0.83	0.93	0.80	0.92	0.72	0.91	0.80	0.92	0.72	0.91

Columns report estimated coefficients (z-statistics). For brevity, constants and autoregressive coefficients at lags 2-4 are not displayed. Equations estimated using Bollerslev-Wooldrige robust standard errors and covariance. The no ARCH and no Serial Correlation hypotheses are accepted in all equations. X_2 is a dummy variable equal to 0 before the fourth quarter of 1999 and equal to 1 thereafter. ***,**,* Statistically significant at the 1%, 5% and 10% confidence level respectively.

The estimated regressions in Table 5.1 show that the variable of the world business cycle ($w\pi_t$) has the expected sign and is statistically significant for both M1 and M2 while the variable of the domestic economic activity ($ygap_t$) has the sign predicted by the theory and is statistically significant for M1 only - probably due to the fact that M2 is not that closely controllable by the monetary authority. Columns (1) and (2) report the results of tests on partisan theories, which imply higher monetary growth rates under left administrations. The coefficient on the permanent partisan dummy ADM_t has the expected sign and is statistically significant at the 5% confidence level in the M1 equation (column (1)) and at the 1% confidence level in the M2 equation (column (2)). The estimated values of the coefficients suggest that the long term equilibrium difference in the monetary growth rates between a left-wing and a right-wing administration is 4.6% for M1 and 5.2% for M2. The corresponding difference in the US is approximately 4% (Alesina *et al.* , 1997). Two issues of robustness involve the effect of the 1999-2000 Cyprus Stock Exchange (CSE) market crash[36] and the impact of real interest rates on the two monetary measures. To control for these effects, we add to the basic regressions of columns (1) and (2) the variable $\overline{se}_t$ representing the yearly percentage change in the CSE general index[37] (see columns (3) and (4)) and the variable Δr_t^L representing the quarterly percentage change in real lending interest rate (see columns (5) and (6)). In both cases, the results on the partisan dummy remain unchanged, both statistically and economically[38]. In addition, following the same strategy as in the previous sections, we restrict the sample to include the pre-2003 period and run the same regressions (see columns (7) and (8)). Not surprisingly, the economic significance of the estimated coefficients on ADM_t is relatively higher for the pre-2003 period than that for the entire sample period. This suggests, once again, that the monetary policy in Cyprus was constrained in the last four years of our sample. Finally, columns (9) and (10) present the results of tests on opportunistic theories, which imply preelectoral monetary expansion. For both money growth measures, the coefficient on the preelectoral dummy $PRE4_t$ is statistically insignificant. This finding seems to be invariant to tests of robustness such as excluding the partisan dummy ADM_t as a regressor, using alternative specifications with $PRE2_t$, $PRE6_t$ or $PRE8_t$, and running the same regressions for the pre-2003 period (see columns (11) and (12)).

We continue with tests on short-term interests rates (i_t^L and i_t^{TB}). As in the case of the monetary growth reaction functions, we have included in the interest rate equations lagged values of the variables $ygap_t$ and $w\pi_t$ to control for the impact of the domestic and world economy on monetary policy adjustments. However, such measures turned out to be statistically insignificant and hence they are not taken into account for these tests. The problem here lies mostly with the small variation exhibited since the nominal interest rates were relatively fixed throughout each year until the start of the financial liberalization process in 1996[39]. Having that in mind, one has to be very cautious in

[36]Spurred by tax incentives, a wave of mergers and initial public offerings, and bank lending for equity purchases, as well as the existence of market abuses that highlighted regulatory and supervisory gaps, the CSE grew eight-fold in the space of less than one year, peaking in November 1999 and then collapsing below its original level over the next two years (Stephanou & Vittas, 2007).

[37]The official Cyprus Stock Exchange was launched by the Cypriot government in March 1996. Therefore, $\overline{se}_t$ takes value 0 in the pre-1996 period.

[38]Including a variable for the world average money growth as a regressor does not change the results either.

[39]Since 1996, most government securities (including the 3-month treasury bills) have been issued through auctions, allowing interest rates to reflect prevailing market conditions. On the other hand, retail bank interest were determined, from time to time, by the CBC until the Interest Rate Liberalization Law came into force in 2001, providing the abolition of the interest rate ceiling. Following interest rate liberalization, banks adopted a base lending rate as the reference rate, to which a margin was added

Table 5.2: Partisan Theories: Nominal Interest Rates

Dependent Variable: Nominal Lending Rate (i_L) (columns (1), (3)); Nomimal T-Bill Rate (i_{TB}) (columns (2), (4))
Method: Maximum Likelihood - ARCH (errors normally distributed)

	(1)	(2)	(3)	(4)
			Post-1996	
t	-0.001***	0.002***	-0.003	0.004
	(6.80)	(3.90)	(0.63)	(0.42)
$DT(01Q1)$	-0.01***	-0.03***	-0.03**	-0.07***
	(2.73)	(3.11)	(2.40)	(3.12)
i^L(-1)	1.22***		1.04***	
	(13.95)		(5.23)	
i^{TB}(-1)		0.83***		0.77***
		(4.16)		(9.64)
wi^L	0.001***		0.06**	
	(6.87)		(2.53)	
wi^{TB}		0.004***		0.11**
		(3.87)		(2.32)
ADM(-2)	-0.04***	-0.01***	-0.19**	-0.22*
	(6.84)	(3.33)	(1.98)	(1.84)
	Variance Equation			
ε^2(-1)	1.98***	9.65**	0.16	0.04
	(2.64)	(2.19)	(0.77)	(0.17)
X_3	0.05	0.19	0.03***	0.06
	(1.57)	(1.09)	(2.64)	(1.24)
R^2	0.97	0.91	0.92	0.90

Columns report estimated coefficients (z-statistics). For brevity, constants and autoregressive coefficients at lags 2-3 are not displayed. Equations estimated using Bollerslev-Wooldrige robust standard errors and covariance. The no ARCH and no Serial Correlation hypotheses are accepted in all equations. X_3 is a dummy variable equal to 0 before the first quarter of 2001 and equal to 1 thereafter. ***,**,* Statistically significant at the 1%, 5% and 10% confidence level respectively.

estimating political cycle effects based on the full sample period and that's why our empirical analysis on interest rates focuses mainly on the 1996-2006 sample, where there is a larger variability in interest rates. The world variable that we chose to use in these regressions is, like in the case of economic outcomes, a world average of the same variable, i.e. the world lending rates (wi_t^L) and the world treasury-bill rates (wi_t^{TB}).

Table 5.2 reports the results of partisan theory tests on nominal interests rates. If monetary policy is systematically more expansionary during left administrations, we expect higher inflation rates and higher nominal interest rates during these administrations than during right ones (a Fisherian effect). Although the findings in columns (1) and (2) provide evidence in favor of this hypothesis (the coefficients on ADM_t are negative and statistically significant), the estimated size effects are close to zero. However, when we consider the shorter sample period 1996-2006 the results become economically more significant. Specifically, the values of the estimated coefficients in columns (3) and (4) imply a difference in the long-run equilibrium interest rate between a left and a right administration of about 0.5% for both measures. It worths noting that since interest rates are procyclical and the output growth is higher under left administrations, the interest rate differential is expected to be higher than the inflation differential. This latter

according to the risk and creditworthiness of the client. As an additional measure, the base rate of banks was set equal to the marginal lending rate, so that changes in the official interest rates by the CBC could be passed on effectively to market rates.

observation may justify the success to find significant partisan differences in nominal interest rates during the 1996-2006 period when the inflation partisan differences were found to be insignificant (and possibly reversed) during the post-2003 period.

An important issue, associated with political effects in monetary policy, is the independency of central banks. One might cite that semi-independent (or independent) central banks can reduce (or eliminate) politically influenced fluctuations in growth and inflation because partisan politicians do not control monetary policy. However, as Alesina *et al.* (1997) point out, governments can have an indirect influence on monetary policy through several channels, such as the presence of government representatives on central bank's boards or the executive's power to appoint the central bank's governor[40]. In addition, monetary authorities cannot be totally detached and impenetrable to society's preferences and government's desires[41]. On the other hand, we cannot expect to commit monetary policy if fiscal policy cannot be precommited at the same time. Beetsma (1999) shows that excessive deficits may induce the Central Bank to adopt a more inflationary stance than otherwise while Hughes Hallett (2008) finds that, despite the rhetoric, central banks do not attempt to punish or discipline fiscally expansive governments. All these arguments provide an explanation why partisan conflicts on the inflation-unemployment trade-off are still present in Cyprus, even in the context of increased central bank independence and financial integration.

5.2 Fiscal Policy

In this section, we examine the effects of elections and partisan politics on fiscal policy. Concerning partisan models, it is not theoretically obvious whether budget deficits are larger under left-wing or right wing administrations. The relevant empirical literature is also controversial. A number of studies support the conventional wisdom that more leftish governments have a tendency to run larger budgets, while several other researches find exactly the opposite effects or no effects at all[42]. Concerning opportunistic models, the theory implies higher budget deficits before elections based on the idea that lower taxes and higher spending might increase votes for the incumbent party. However, most empirical studies focusing on industrial countries find little support for such election-driven fiscal policy manipulations. The empirical evidence for member countries of the EU is also weak (see De Haan & Sturm, 1994; Andrikopoulos *et al.* , 2004). On the other hand, a number of studies concentrating on the old member countries of the EU (see von Hagen, 2003; Buti & van den Noord, 2003) argue that in more recent years fiscal policy often turned expansionary before elections. Given these mixed results, it is of great interest to investigate the same questions in the case of Cyprus. The analysis uses annual time series data and, hence, the political dummies ADM_t, PRE_t are redefined to capture partisan and electoral differences on a yearly basis[43].

We begin by considering real budget deficits, measured by the yearly change in the government public debt (as a share of GDP) ($\frac{\Delta b_t}{GDP_t}$). Following the econometric procedure described in Sections 3.1 and 3.2, the data were subject to DF tests and diagnostic checks of model adequacy, providing evidence that the variable $\frac{\Delta b_t}{GDP_t}$ is trend stationary

[40]The Cyprus Monetary Policy Committee (MPC) comprises the Governor and five other members, three of whom are appointed by the Council of Ministers on the recommendation of the Minister of Finance. The Governor is appointed by the President for a 5 years term (renewable).

[41]Syrichas & Karamanou (2004) stress that without prejudice to the objective of price stability, the Central Bank of Cyprus supports the general economic policy of the government.

[42]For an extensive overview of the corresponding empirical literature see Liargovas & Manolas (2007).

[43]Since the presidential elections in Cyprus occur in the first quarter of year t, the preelectoral dummy PRE_t takes on value 1 in the preelectoral year $(t-1)$.

(without breaks) and that one annual lag is sufficient to capture its autoregressive component. In order to control for the standard economic determinants of budget deficits, we use the tax-smoothing model of Barro (1986)[44]. Hence, the estimated equation, which embodies partisan and opportunistic hypotheses, is written as follows:

$$\frac{\Delta b_t}{GDP_t} = a_0 + a_1 t + a_2 \frac{\Delta b_{t-1}}{GDP_{t-1}} + a_3 \frac{\pi_t^e b_{t-1}}{GDP_t} + a_4 UVAR_t + a_5 GVAR_t + a_6 PDUM_t + e_t \quad (4)$$

where t is a linear trend, π_t^e is the expected rate of inflation, $UVAR_t$ is a measure for cyclical fluctuations computed as $(u_t - u_t^*)(\frac{g_t^*}{GDP_t})$, where u_t is the unemployment rate, g_t is the government spending and the asterisk denotes long-run components derived using a Hodrick-Prescott filter, $GVAR_t$ is a measure for transitory spending shocks computed as $\frac{(g_t - g_t^*)}{GDP_t}$, $PDUM_t$ is a political dummy variable reflecting the implications of different theories and e_t is an error term. According to this model, budget deficits emerge during recessions and are higher when spending is temporarily high. Thus, the coefficients on $UVAR_t$ and $GVAR_t$ are expected to be positive. Similarly, the coefficient on $\frac{\pi_t^e b_{t-1}}{GDP_t}$ should be positive, since there is a tendency to adjust the nominal debt in order to compensate expected inflation. As in Barro (1986), we obtain a measure for the expected inflation by estimating a system of two equations, one for deficits and one for inflation. Expected inflation is generated as a forecasting relation using two annual lags of inflation, π_{t-1} and π_{t-2}, and one annual lag of monetary growth (based on annual averages of M2), $m2_{t-1}$. Before studying partisan and electoral effects on fiscal deficits we must also control for differences in government structure and budget voting procedures (see Roubini & Sachs, 1989). To do so, we add to the above model the variable $POLV_t$ representing the degree of government fragmentation[45] multiplied by the fraction of legislators (members of the Cyprus House of Representatives) who vote against the approval of the proposed annual budget[46]. We expect the coefficient on $POLV_t$ to be positive since a higher degree of disagreement over the budget (during periods with different parties in control of the executive and legislative branch), delays fiscal adjustment to external shocks and as a result, government debt accumulates more rapidly and to a larger extent.

Table 5.3 presents the corresponding results estimated using iterative weighted least squares[47]. As in the previous sections, the system is estimated separately for the periods 1978-2006 and 1978-2003, in order to test for the impact of the fiscal consolidation associated with the Maastricht criteria for EMU membership. Columns (1) and (2) show the results when we introduce the partisan dummy ADM_t. Starting with the economic variables, we observe that (i) about one quarter of the lagged budget persists in the following year (the coefficient on $\frac{\Delta b_{t-1}}{GDP_{t-1}}$), (ii) expected inflation does not seem to affect the real value of debt (the coefficient on $\frac{\pi_t^e b_{t-1}}{GDP_t}$ is both economically and statistically insignificant), (iii) budget deficits are countercyclical (the coefficient on $UVAR_t$ is positive and statistically significant in the 1978-2003 regression) and (iv) transitory spending shocks tend to increase real budget deficits (the coefficient on $GVAR_t$ is positive and

[44]The definition of variables is similar to Barro (1986) and, therefore, differs somewhat from Alesina *et al.* (1997).

[45]Government fragmentation, as defined in Roubini & Sachs (1989), is captured by a dummy variable that takes value 0 when the parties members of the coalition hold the majority in the legislature and 1 when they do not hold the majority in the legislature.

[46]The data were retrieved from the library of the Cyprus House of Representatives.

[47]It should be noted that if we set the expected rate of inflation (π_t^e) equal to the growth rate of nominal wages or the actual rate of inflation of the previous year and estimate the deficit equation by ordinary least squares, we obtain similar estimated coefficients and standard errors. Thus, our results are not driven by the use of an embedded estimator in the construction of π_t^e.

Table 5.3: Political Cycles Theories: Budget Deficits

Dependent Variable: Real Budget Deficit ($\frac{\Delta b}{GDP}$) Method: Iterative Weighted Least Squares				
	Partisan Theories		Opportunistic Theories	
	(1)	(2)	(3)	(4)
		pre-2003		pre-2003
t	-0.10**	0.002	-0.10**	0.002
	(2.19)	(0.06)	(2.19)	(0.06)
$\frac{\Delta b}{GDP}$(-1)	0.26	0.20	0.26	0.20
	(1.49)	(1.25)	(1.48)	(1.24)
$\frac{\pi^e b(-1)}{GDP}$	-0.004	-0.007	-0.005	-0.007
	(0.64)	(1.20)	(0.66)	(1.20)
$UVAR$	3.00	4.10*	3.05	4.11*
	(1.04)	(1.87)	(1.05)	(1.87)
$GVAR$	1.15***	1.21***	1.15***	1.21***
	(3.68)	(5.08)	(3.67)	(5.06)
$POLV$	4.20*	3.05*	4.05*	3.01*
	(1.90)	(1.80)	(1.78)	(1.73)
ADM	0.08	-0.71	0.07	-0.71
	(0.14)	(1.55)	(0.12)	(1.55)
PRE			0.22	0.06
			(0.26)	(0.09)
R^2	0.55	0.65	0.55	0.65
Dependent Variable: Inflation (π)				
π(-1)	0.74***	0.77***	0.74***	0.77***
	(4.56)	(4.41)	(4.56)	(4.41)
π(-2)	-0.21	-0.25	-0.21	-0.25
	(1.29)	(1.44)	(1.29)	(1.44)
$m2$(-1)	0.23***	0.28***	0.23***	0.28***
	(2.73)	(2.50)	(2.73)	(2.50)
R^2	0.68	0.68	0.68	0.68

Columns report estimated coefficients (t-statistics). For brevity, constants are not displayed. The no Serial Correlation hypotheses are accepted in all equations. ***,**,* Statistically significant at the 1%, 5% and 10% confidence level respectively.

statistically significant). Concerning the political variable $POLV_t$, we note that the estimated coefficient has the expected positive sign and is statistically significant, suggesting that government fragmentation in relation with budget approval procedures are responsible for larger budget deficits. Turning, finally, to the partisan variable ADM_t, we can see that in the full sample regression (column (1)) the estimated coefficient is positive and statistically insignificant but when we restrict the sample to include the pre-2003 period (column (2)) the estimated coefficient becomes negative and is now very close of being statistically significant, implying that left wing administrations are more deficit-prone than right-wing administrations. Economically, the estimated coefficient on ADM_t implies that the difference in the long run equilibrium budget deficit between a left and a right government is nearly 1%. The latter results indicate that partisanship used to affect budget deficits but the implementation of the Maastricht criteria has eliminated its impact. Columns (3) and (4) show the results when we introduce in columns (1) and (2) the preelectoral dummy PRE_t. In both regressions the sign of the estimated coefficient is the expected one (deficits are higher in the year before the elections) but the effect is statistically insignificant. These findings seem to persist when partisan effects are not held constant.

The failure to obtain an electoral cycle in the overall budget deficits does not neces-

Table 5.4: Political Cycles Theories: Fiscal Balance Subcomponents

Dependent Variable: First Difference of Transfer Payments over GDP ($\frac{\Delta trg_t}{GDP_t}$) (columns (1)-(4)), First Difference of Direct Taxes over GDP ($\frac{\Delta dtx_t}{GDP_t}$) (columns (5)-(8))
Method: Least Squares

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			pre-2003				pre-2003	
t	0.02**	0.03**	0.03**	0.03*	-0.01	-0.02	-0.03	-0.04**
	(2.25)	(2.21)	(2.13)	(2.06)	(0.55)	(0.87)	(1.48)	(2.55)
$\frac{\Delta trg}{GDP}$(-1)	0.51**	0.47*	0.66*	0.61				
	(2.09)	(1.85)	(1.75)	(1.50)				
$\frac{\Delta dtx}{GDP}$(-1)					0.14	0.04	-0.004	-0.09
					(0.51)	(0.19)	(0.01)	(0.55)
Δy	-0.01		-0.01		0.07**		0.07**	
	(0.38)		(0.44)		(2.16)		(2.58)	
Δu		0.09		0.06		-0.82***		-0.82***
		(0.65)		(0.39)		(5.12)		(6.17)
ADM	-0.06	-0.08	-0.13	-0.14	0.08	0.18	0.25	0.38***
	(0.55)	(0.67)	(0.95)	(0.96)	(0.44)	(1.23)	(1.20)	(3.15)
PRE	0.33*	0.33**	0.32*	0.30*	-0.57**	-0.60**	-0.59**	-0.60***
	(1.98)	(2.25)	(1.92)	(2.02)	(2.16)	(2.46)	(2.67)	(3.22)
R^2	0.67	0.67	0.67	0.67	0.20	0.43	0.36	0.64

Columns report estimated coefficients (t-statistics). For brevity, constants are not displayed. Equations estimated using White heteroskedasticity-consistent standard errors and covariance. The no ARCH and no Serial Correlation hypotheses are accepted in all equations. ***,**,* Statistically significant at the 1%, 5% and 10% confidence level respectively.

sarily mean that elections do not affect fiscal policy. More visible and politically sensitive instruments may be more easily and productively manipulated than others (see Rogoff, 1990) and, therefore, one should also try to find possible electoral effects in subcomponents of government spending and revenues. Having that in mind, we continue our analysis with tests on transfer payments and direct taxes[48]. We take as dependent variables the yearly changes in transfer payments and direct taxes over GDP, denoted by $\frac{\Delta trg_t}{GDP_t}$ and $\frac{\Delta dtx_t}{GDP_t}$ respectively. At a first stage, we examine the unit root properties of the series and perform diagnostic checks of model adequacy to obtain the most appropriate model for each variable. We find evidence that both dependent variables are trend stationary (without breaks) and that the best autoregressive specification is an AR(1). In order to control for the impact of business cycle, we add to the chosen models two alternative measures: the yearly change in the unemployment rate (Δu_t) and the yearly change in the real GDP growth (Δy_t). Transfer payments are expected to increase when there is a growth slowdown and when unemployment goes up while direct taxes should follow exactly the opposite direction. Table 5.4 displays the results of these regressions when we include the partisan dummy ADM_t and the preelectoral dummy PRE_t among the regressors. Specifically, Columns (1), (2), (5) and (6) present the results for the entire sample period while columns (3), (4), (7) and (8) the results for the pre-2003 sample period. The dependent variables appear to be procyclical (the coefficients on Δy_t and Δu_t have the expected signs) but the effects are statistically significant only in the direct taxes regressions. The estimates on ADM_t provide evidence, although statistically weak, that transfer payments are higher and direct taxes are lower during left-wing administrations. In addition, the statistical significance of ADM_t in column (8) implies that the partisan cycle found in Table 5.3 for the pre-2003 period derives from reduced taxes during left governments. Finally, the results on the electoral dummies confirm the

[48]These two measures tend to be more easily controlled in election years.

speculation that when we focus on compositional effects, electoral cycles in fiscal policy become feasible: the estimated coefficients on PRE_t have the expected signs (transfer payments are higher before elections and direct taxes are lower before elections) and all of them are statistically significant at conventional levels of significance. Repeating the same analysis on other subcomponents of the fiscal balance produces some interesting results, as well. In particular, we find that governments tend to increase indirect taxes at the beginning of their term so as to be able to reduce direct taxes at the end of their term when they face elections. Moreover, we find that the administration in power tries to balance the increased preelectoral government spending, caused by higher transfer payments, by reducing expenditures on investment projects[49].

5.3 Conclusions

Section 5 follows the same empirical analysis as in Section 4 to examine the presence of political cycles in macroeconomic policy instruments in the case of Cyprus. The findings support, once again, the partisan theories and match those found in the previous section for economic outcomes. In particular, the evidence, during the period 1978-2003, is consistent with the view that (i) left wing governments follow more expansionary monetary policies than right wing governments (monetary growth aggregates and, to a lesser extent nominal interest rates, are systematically higher during left administrations) and (ii) left wing governments tend to be more deficit-prone than right wing governments (fiscal deficits are relatively higher during left administrations). Concerning opportunistic manipulation of policy instruments, we find strong evidence of an electoral cycle in subcomponents of the fiscal balance: transfer payments are higher and direct taxes are lower close to election quarters. The latter results, together with those on inflation in Section 4.3, support the rational opportunistic models of Rogoff & Sibert (1988) and Rogoff (1990). It should be noted that the corresponding tests performed by Alesina *et al.* (1997) on data from other countries do not provide similar results in all cases. Specifically, Alesina *et al.* (1997) find supportive evidence of electoral cycles in monetary policy instruments in a large set of OECD countries and no evidence of preelectoral manipulation of fiscal policy in the United States. The diversity of results is probably driven by the fact that different countries use different combination of instruments to achieve their political goals and this combination may change over time. For instance, in the case of Cyprus, the small variation exhibited in the nominal interest rates before 1996, induced governments to use alternative policy instruments to generate politically-motivated economic outcomes, i.e. targeting monetary aggregates or turning to fiscal policy instruments. The empirical analysis of Section 5 also confirms the findings about the change of the direction of partisan effects in the post-2003 period. In other words, it supports the argument that the implementation of structural reforms and the strict provisions of the Maastricht criteria allow limited national policy autonomy.

6 Discussion

Why do partisan cycles appear in Cyprus? As we have already seen, governments' ideological preferences influence the economic performance in Cyprus, despite the smallness and openness of its economy. However, the presence of partisan effects in Cyprus, especially during the pre-2003 period, is also striking for another reason. It contradicts the argument of Alesina *et al.* (1997) that such effects are not easily identifiable in countries where the broad-based coalitions are the rule or where the government

[49] This is consistent with the rational opportunistic model of Rogoff (1990).

has no full control of executive and legislative powers (as in the case of Cyprus). These observations, together with the lack of similar evidence in a number of EU countries[50], raises the following question: what are the special characteristics of the political environment and economy of Cyprus that make the partisan model (and its rational version) empirically successful against all predictions? Although there is no clear answer, some speculations can definitely be made. First, the larger gap in economic ideology between the left and the right party, compared to the one of other countries[51], may cause sharper conflicts about the distribution of income and wealth. Second, the electoral system that allows the formation of coalitions a few days before the elections[52], can increase the degree of surprise in the electoral result and lead to a larger postelectoral economic impact[53]. Third, the wage indexation, which characterizes the economy since 1960, can reduce the impact of inflation uncertainty on the real sector in the long-run (see Holland, 1986), and support the assumption of rationality incorporated in the model. Overall, we conclude that a clear partisan cycle emerges in economies with particular characteristics and no generalizations can be made without taking into account all possible aspects of a country's partisan structure, electoral system, institutional design and so on. That's why analogous studies on large multicountry samples and for long time periods run the risk of producing misleading results if not carefully consider all these parameters.

Will politics matter for macroeconomic policies in the future? Alesina *et al.* (1997) predict that in the near future partisan conflicts on the inflation-unemployment trade-off will not disappear, even in the context of a monetary union, while partisan and distributional conflicts over fiscal decisions are likely to become sharper. The findings of this study call into question the above arguments since they imply that politics become less important for economic policy as the degree of economic integration with EMU members increases, at least in the case of Cyprus (i.e. partisan differences in inflation and fiscal deficits vanish completely when we consider the entire sample period). However, this result does not necessarily mean that this pattern will continue forever. It is likely that the structural change observed in the direction (and size) of partisan effects coincides with a short period of distinct convergence with the Eurozone standards, and that in the future partisan governments will continue generating economic fluctuations around a new equilibrium. On the other hand, we can not rule out the possibility that the strong partisan ideologies of the past will begin converging, especially inside the EMU, and eventually political parties will become alike in terms of macroeconomic management (to avoid the costs of economic destabilization). Under this scenario two things can happen. First, political cycles will be limited to electoral

[50] Alesina & Roubini (1992) find evidence in favor of the rational partisan model for a sample of eighteen OECD countries, including eleven members of the EU, but the corresponding evidence for many subsamples (i.e. specific countries) is not that overwhelming.

[51] In most countries the "left" is associated with various models of socialism while in Cyprus the "left" is associated with communism (and socialism moves to the center of the political spectrum). It should be noted that in principle, the left party in Cyprus (AKEL) opposes privatization and liberalization, but in practice, it tolerates the economic policy implications that come with EU membership.

[52] A candidate to be elected as a president needs more than 50% of the votes validly cast. If none of the candidates attains the required majority, the election is repeated on the corresponding day of the following week between the two candidates who received the greater number of votes. During that week, coalitions can be formed between the defeated candidates of the first round (and their parties) and the winning candidates (and their parties).

[53] One of the rational theory's implications is that the size of the postelectoral real effect of monetary and fiscal policies depends on the degree of electoral surprise.

budget cycles[54] or focus on opportunistic manipulation of fiscal policy instruments à la Rogoff (1990). That is, governments will choose policies that are easy to employ in the short-run and with little effects on the aggregate economy (i.e. shifting spending to more visible programs that may favor key constituencies). Second, politicians will try to maximize their chances of electoral victory by growing party differentiation on the basis of different positions regarding pure political issues, rather than economic ideologies[55]. These points, of course, require a more detailed treatment and would be an interesting topic for future research, for both economists and political analysts.

Acknowledgements

I would like to thank Dr Walter Beckert and Professor Ron Smith for their helpful comments and suggestions on preliminary versions of this text. All remaining errors and omissions are mine.

[54]The empirical evidence on the initial years of EMU supports the existence of a political budget cycle in EU member countries in the euro area despite the adoption of the Stability and Growth Pact (see Mink & De Haan, 2005).

[55]This, in turn, suggests that there will be an increased need for coordination among the left and the right parties of different countries (i.e. among EU member countries in the Eurozone), to design common political strategies.

A Appendix

A.1 Econometric Theory

A.1.1 Unit Root Tests

The assumptions of the classical regression model necessitate that the series be stationary and that the errors have zero mean and a finite variance (Enders, 2003). In the presence of nonstationary variables, there might be what Granger & Newbold (1974) call a spurious regression. A spurious regression has a high R^2 and t-statistics that appear significant, but the results are without any economic meaning. Therefore, pretesting the variables in a regression for nonstationarity is extremely important. Dickey & Fuller (1979, 1981) (to be referred to as DF) provide the appropriate test statistics to determine whether a series contains a unit root (is integrated of order one) and hence it appears to be nonstationary. One major drawback of the DF unit root tests is that they overlook the occurrence of structural changes[56]. Perron (1989) argues that the presence of structural breaks will bias the tests towards the non rejection of a unit root and proposes a modified DF test that includes dummy variables to allow for one known, or exogenous, structural break. Subsequent papers use a variety of sequential tests allowing for unknown breakpoints that are determined endogenously from the data. Zivot & Andrews (1992) (to be referred to as ZA) select the breakpoint where the t-statistic testing the unit root hypothesis is the most negative while Lumsdaine & Papell (1997) (to be referred to as LP) extent the ZA model to accommodate two structural breaks. A limitation on these two tests is that the critical values are derived while assuming no breaks under the null hypothesis leading to size distortions and spurious rejections. To address this issue Lee & Strazicich (2003a) propose an one-break Lagrange multiplier (LM) unit root test as an alternative to the ZA test and Lee & Strazicich (2003b) suggest a two-break LM unit root test as an alternative to the LP test.

A.1.2 Box-Jenkins modeling procedure and ARCH techniques

Box & Jenkins (1976) popularized a three-stage method aimed at selecting an appropriate model for estimating a univariate time series. In the *identification stage*, we examine the time plot of the series, the autocorrelation function and the partial correlation function to decide which autoregressive moving-average components should be used in the model. Note that a comparison of the sample ACF and PACF to those of various theoretical ARMA processes may suggest several plausible models. In the *estimation stage*, we estimate each of the alternative models by OLS, examine the various coefficients and compare the estimated models using the criteria of parsimony and goodness of fit. Finally, in the *diagnostic checking stage*, we test whether the selected model conforms to the specifications of a stationary univariate process. In particular, the residuals should be independent from each other and constant in mean and variance over time.

Many economic time series exhibit phases of relative tranquility followed by periods of high volatility (and vice versa). In such circumstances the homoscedasticity assumption is inappropriate[57] and therefore we need to extend Box-Jenkins methodology to include ARCH effects in the regression framework. To do so, we examine the ACF and

[56] A structural change (or break) appears when there is an unexpected shift in the mean or the slope of the deterministic trend line (or both) of a (macroeconomic) time series. This may be due to external forces, internal political and economic changes or other factors.

[57] Note that for series exhibiting volatility, the unconditional (or long-run) variance may be constant even though the variance during some periods is unusually large.

PACF of the squared residuals, identify the order of the ARCH[58] process and estimate the mean equation and the selected ARCH process simultaneously by maximum likelihood techniques. The estimated models should provide a good fit and the residuals should be serially uncorrelated and not display any remaining conditional volatility. If the estimation is inadequate, we have to return to step one and attempt to build a better model.

[58]The key feature of an ARCH(λ) model is that the conditional variance constitutes an autoregressive process of order λ, or alternatively, depends on past λ realizations of the error process. The basic model can be extended in a number of different ways. For instance, we can include explanatory variables in the equation for the conditional variance.

A.2 Tables

Table A.2.1: Empirical Implications of Opportunistic Models

Traditional models	Rational models
Regular multiyear cycle in growth and unemployment: growth is above normal (unemployment below normal) in the year or two before an election; growth falls (unemployment increases) after the election.	No regular multiyear cycle in growth and in unemployment.
Monetary and fiscal policies are expansionary in the year or two before the election and contractionary in the year or two after the election.	Monetary and fiscal policies are expansionary two to three quarters preceding an election and contractionary two to three quarters after the election; smaller and shorter-lived effects than in the traditional model.
Inflation begins to increase immediately before an election, continues to increase for a few quarters after the election, then falls.	Same as for the traditional model, but smaller and shorter-lived effects on inflation.

Source: Alesina *et al.* (1997)

Table A.2.2: Empirical Implications of Partisan Models

Traditional models	Rational models
Growth permanently higher, unemployment permanently lower when the left is in office.	Growth is temporarily higher, unemployment temporarily lower than the natural rate after a left-wing election victory; the opposite is true after a right-wing electoral victory.
	Deviation of growth and unemployment from natural rates is correlated with the amount of electoral surprise.
	Unemployment and growth return to their natural rates in the second part of both right and left-wing terms of office.
Inflation permanently higher when the left is in office.	Inflation permanently higher when the left is in office.

Source: Alesina *et al.* (1997)

Table A.2.3: Cyprus Economic Data

Quarterly Data	Sample	Source
Gross Domestic Product, s.a	1981:4-2006:4	Economics Research Center Central Bank of Cyprus
Registered Unemployment Rate (total), s.a	1978:1-2006:4	Statistical Service of Cyprus Central Bank of Cyprus
Consumer Price Index, s.a	1978:1-2006:4	Eurostat
Monetary Supply M1, s.a	1978:1-2006:4	Eurostat
Monetary Supply M2, s.a	1978:1-2006:4	Eurostat
3-month Treasury Bill Rate	1978:1-2006:4	IMF-IFS
Retail Bank Marginal Lending Rate	1978:1-2006:4	IMF-IFS
Tourists Arrivals, s.a	1978:1-2006:4	Statistical Service of Cyprus
Cyprus Stock Exchange General Index, s.a.	1996:1-2005:4	Eurostat
Bank Credit, s.a	1978:1-2006:4	IMF-IFS
Yearly Data	**Sample**	**Source**
Government's Public Debt	1978-2006	Ministry of Finance
Components of Fiscal Balance	1978-2006	Ministry of Finance

s.a = seasonally adjusted using the X12 ARIMA method of the US Census Bureau

Table A.2.4: Cyprus Political Data

1978:1	E	C	DIKO (centrist) holds the presidency
1983:1	E	CL	DIKO† (centrist) and AKEL (left) form coalition government
1984:4		C	AKEL (left) pulls out of coalition government
1988:1	E	L	Independent president with left background - nominated and supported by AKEL (left)
1993:1	E	CR	DISY† (right) and DIKO (centrist) form coalition government
1997:4		R	DIKO (centrist) pulls out of coalition government
1998:1	E	CR	DISY† (right) and EDEK (centrist) form coalition government
1999:1		R	EDEK (centrist) pulls out of coalition government
2003:1	E	CL	DIKO† (centrist), EDEK (centrist) and AKEL (left) form coalition government

Exogenous timing of presidential elections: 5 years

E = presidential election; R = right government; CR = center-right government;

L = left government; CL = center-left government; C = center government

† holds the presidency

Table A.2.5: Important Economic and Political Events (1978-2006)

Date	Event Description
1979:1-1981:4	Second oil crisis period
1985:4-1986:3	Oil price crash
1987:4	A protocol for the second stage of the Association Agreement with the European community was signed
1990:3-1991:1	The Persian Gulf War
1992:2	The Cyprus pound was linked to the European Currency Union (ECU)
1992:3	The British pound and the Italian lira left the European Exchange Rate Mechanism
1996:1	The Central Bank of Cyprus introduced a new framework of monetary policy implementation
1999:1-1999:2	The Kosovo War
1999:1	Replacement of the ECU by the Euro
1999:4-2000:1	Cyprus Stock Market Crash
2000:3	The Cyprus government introduced a new way of calculating the oil prices
2001:1	Liberalization of the interest rates
2001:3	Terrorist attack on the United States
2003:1	The Iraq War
2004:2	Cyprus became a full member of the European Union
2005:2	The Cyprus pound joined the European Exchange Mechanism (ERM-II)

Source: Christofides *et al.* (2006a)

References

Alesina, A. 1987. Macroeconomic Policy in a Two-Party System as a Repeated Game. *The Quarterly Journal of Economics*, **102**, 651–678.

Alesina, A. 1988. *Macroeconomics and Politics. In NBER Macroeconomic Annual 1988 11-55.* The MIT Press: Cambridge.

Alesina, A., & Rosenthal, H. 1995. *Partisan Politics, Divided Government and the Economy.* Cambridge University Press: Cambridge.

Alesina, A., & Roubini, N. 1992. Political Cycles in OECD economies. *Review of Economic Studies*, **59**, 663–688.

Alesina, A., Roubini, N., & Cohen, G. D. 1997. *Political Cycles and the Macroeconomy.* The MIT Press: Cambridge.

Andrikopoulos, A., Loizides, I., & Prodromidis, K. 2004. Fiscal policy and political business cycles in the EU. *European Journal of Political Economy*, **20**, 125–152.

Barro, R. J. 1986. U.S. Deficits Since World War I. *The Scandinavian Journal of Economics*, **88**, 195–222.

Beetsma, R. 1999. *The stability and growth pact in a model with politically induced deficit biases.* In: Fiscal Aspects of European Monetary Integration. Cambridge Universiy Press: Cambridge.

Box, G., & Jenkins, G. 1976. *Time Series Analysis, Forecasting, and Control.* San Francisco: Holden Day.

Buti, M., & van den Noord, P. 2003. *Discretionary and fiscal policy and elections: The experience of the early years of EMU.* OECD Economics Department Working Papers. OECD Economics Department.

Chow, G. C. 1960. Tests of Equality between Sets of Coefficients in Two Linear Regressions. *Econometrica*, **28**, 591–605.

Christofides, L., Kourtellos, A., & Stylianou, I. 2006a. *Approaches towards the development of a model of the Cyprus economy (In Greek).* Economic Policy Papers: 13-06. University of Cyprus, Economics Research Center.

Christofides, L., Kourtellos, A., & Stylianou, I. 2006b. *A small macroeconomic model of the Cyprus economy.* Economic Policy Papers: 02-06. University of Cyprus, Economics Research Center.

Cukierman, A., & Meltzer, A. H. 1986. A Positive Theory of Discretionary Policy, the Cost of Democratic Government and the Benefits of a Constitution. *Economic Inquiry*, **24**, 367–388.

De Haan, J., & Sturm, J-E. 1994. Political and institutional determinants of fiscal policy in the European Community. *Public Choice*, **80**, 157–172.

Dickey, D., & Fuller, W. A. 1979. Distribution of the Estimates for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association*, **74**, 427–431.

Dickey, D., & Fuller, W. A. 1981. Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root. *Econometrica*, **49**, 1057–1072.

Enders, W. 2003. *Applied Econometric Time Series, 2nd edition.* Wiley: New York.

Granger, C., & Newbold, P. 1974. Spurious Regressions in Econometrics. *Journal of Econometrics*, **2**, 111–120.

Gujarati, D. 1992. *Essentials of Econometrics.* McGraw-Hill International Editions.

Hasapis, C. 2007. *Inflation, Long-Term Interest Rate Convergence and the Maastricht Criteria (In Greek).* Economic Policy Papers: 03-07. University of Cyprus, Economics Research Center.

Hibbs, D. 1977. Political Parties and Macroeconomic Policy. *American Political Science Review*, **71**, 1467–1487.

Holland, A. S. 1986. Wage Indexation and the Effect of Inflation Uncertainty on Employment: An Empirical Analysis. *American Economic Review*, **76**, 235–243.

Hughes Hallett, A. 2008. Are independent central banks really as conservative as they like to pretend? *European Journal of Political Economy*, **24**, 239–248.

Karamanou, P., Lavan, M., Robinson, P., & Syrichas, G. 2001. *Monetary Policy Transmission Mechanism in Cyprus: A Fixed Exchange Rate Case.* Working Papers: 2001. Central Bank of Cyprus.

Kontolemis, Z. G. 1993. *On the Determinants of Consumer Price Inflation in a Small Open Economy: the Case of Cyprus, 1963-1990.* Discussion Paper No. 91. University of Cyprus.

Lee, J., & Strazicich, M. C. 2003a. *Minimum LM Unit Root Test with One Structural Break.* Working Paper. Department of Economics, Appalachaine State University.

Lee, J., & Strazicich, M. C. 2003b. Minimum LM Unit Root Test with Two Structural Breaks. *Review of Economics and Statistics*, **63**, 1082–1089.

Liargovas, P., & Manolas, G. 2007. Do Conservative Governments Make a Difference in Fiscal Policy? Evidence from the U.S. amd the U.K. *Journal of Economic Issues*, **41**, 863–872.

Lindbeck, A. 1976. Stabilization Policy in Open Economies with Endogenous Politicians. *American Economic Review*, **66**, 1–19.

Lumsdaine, R. L., & Papell, D. H. 1997. Multiple Trend Breaks and the Unit Root Hypothesis. *Review of Economics and Statistics*, **79**, 212–218.

Maddala, G. S., & Kim, In-Moo. 1998. *Unit Roots, Cointegration and Structural Change.* Cambridge University Press: Cambridge.

Mink, M., & De Haan, J. 2005. *Has the Stability and Growth Pact Impeded Political Budget Cycles in the European Union?* CESifo Working Paper. Paper No. 1532.

Ng, S., & Perron, P. 1995. Unit Root Tests in ARMA Models with Data-Dependent Methods for the Selection of the Truncation Lag. *Journal of the American Statistical Association*, **90**, 268–281.

Nordhaus, W. 1975. The Political Business Cycle. *Review of Economic Studies*, **42**, 169–190.

Pashardes, P., & Hajispyrou, S. 2003. *The economic effects of the Turkish invasion on the Greek Cypriots*. Economic Policy Papers: 06-03. University of Cyprus, Economics Research Center.

Perron, P. 1989. The Great Crash, the Oil Price Shock, and the Unit Root Hypothesis. *Econometrica*, **57**, 1361–1401.

Persson, T., & Tabellini, G. 1990. *Macroeconomic Policy, Credibility and Politics*. Harwood Academic Publishers: Chur, Switzerland.

Rogoff, K. 1990. Equilibrium Political Budget Cycles. *American Economic Review*, **80**, 21–36.

Rogoff, K., & Sibert, A. 1988. Elections and Macroeconomic Policy Cycles. *Review of Economic Studies*, **55**, 1–16.

Roubini, N., & Sachs, J. 1989. Political and Economic Determinants of Budget Deficits in the Industrial Democracies. *European Economic Review*, **33**, 903–933.

Stephanou, C., & Vittas, D. 2007. Public Debt Management and Debt Market Development in Cyprus: Evolution, Current Challenges and Policy Options. *Cyprus Economic Policy Review*, **1**, 49–80.

Syrichas, G., & Karamanou, P. 2004. *Monetary Policy and Central Bank Communication: The case of Cyprus*. Working Papers: 2004. Central Bank of Cyprus.

Taylor, J. 1993. Discretion versus Policy Rules in Practice. *Carnegie-Rochester Conference Series on Public Policy*, **39**, 195–214.

Temple, J. 1997. The New Growth Evidence. *Journal of Economic Literature*, **37**, 112–156.

von Hagen, J. 2003. *Fiscal discipline and growth in Euroland. Experiences with the Stability and Growth Pact*. ZEI Working Paper. No. B062003.

Zivot, E., & Andrews, K. 1992. Further Evidence on the Great Crash, The Oil Shock, and The Unit Root Hypothesis. *Journal of Business and Economic Statistics*, **10**, 251–270.